

American

# FORESTS

DECEMBER 1952

25 CENTS



PART I



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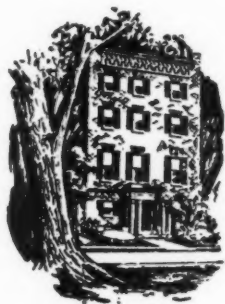
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DECEMBER, 1952



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The American Forestry Association, publishers of *American Forests*, is a national organization— independent and non-political in character—for the advancement of intelligent management and use of forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is to create an enlightened public appreciation of these resources and the part they play in the social and economic life of the nation. Created in 1875, it is the oldest national forest conservation organization in America.

# American FORESTS

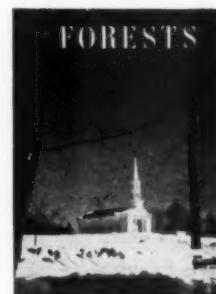
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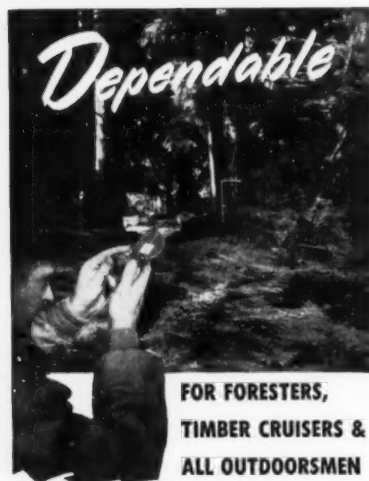
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## Cover

*As much a part of New England as its Yankee twang is this white, spired church in South Sudberry, Mass. Serene and peaceful in its niche against the sky, Martha-Mary Church extends warm welcome to passersby in this, the Christmas season. Soon the bells will ring a carol and the sharp December air will carry the happy voices of well-wishers into a new year bright with expectation, but still reminiscent of the days gone by. Part of the late Henry Ford's restoration program in the area, the church is located near the famous Wayside Inn. Photographer Louis C. Williams.*



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# American FORESTS Forum

**Our Readers Say**—From VICTOR A. GREULACH, Professor of Botany at the University of North Carolina, Chapel Hill, comes the following letter in which he takes issue with the article, *Chlorophyll—Green Magic*, which appeared in the October issue:

I have just read the article by Cleveland van Dresser on chlorophyll in your October issue. I regret that it is necessary for me to be critical of it rather than laudatory, but I find it to be impossibly bad. Not only does he propagate the exaggerated claims made for chlorophyll as a deodorant by the advertisers, which at best are greatly exaggerated and without sound scientific substantiation and are actually probably mostly bunk, but he makes one error after another in discussing plant physiological topics such as the nature of chlorophyll, its role in photosynthesis, the process of photosynthesis, other physiological processes, and the history of research on chlorophyll and photosynthesis. He implies, though he does not actually state, the falsehood that the so-called research on chlorophyll as a deodorant is a direct outgrowth of research done by the government.

I do not know who Mr. van Dresser is, but I am sure he has no knowledge of plant physiology or other plant sciences and suspect he is a press agent for companies selling chlorophyll derivatives. I think it is most unfortunate that the mass of misinformation about chlorophyll to which the public has been exposed has been added to by a publication which has the reputation and standing of yours.

(EDITOR'S NOTE: Mr. Van Dresser is a free lance writer of 30 years' experience. His article came to AMERICAN FORESTS documented by a leading research engineer in the field of chlorophyll development. Subsequent checking by our own research staff has shown that there is general agreement among those who have studied chlorophyll and its properties that the substance does neutralize odors if used in sufficient quantities.)

And from BERNARD M. EPSTEIN, Brooklyn, N. Y. student, comes another comment on *Chlorophyll—Green Magic*:

While reading through your magazine AMERICAN FORESTS of October 1952 I came across the article on *Chlorophyll—Green Magic* by Cleveland van Dresser and having heard from my high school chemistry teacher who I consider well informed in the field of chemistry that chlorophyll had absolutely no effect on bad breath and body odors, etc., I brought the article to him and showed him the following part from the article: "He has also learned that it (chlorophyll) neutralizes the odor of decay and that it actually performs that greatly over-

advertised function, an aid to digestion." When my teacher saw this he said that as far as he knew this was completely untrue. Would you please let me know if this is true and if so, give me some facts to back this up so that I may show them to my chemistry teacher.

**Writes MARION CLAWSON, Director, Bureau of Land Management:**

I have read with much interest Mr. C. M. Granger's article *The National Forests are in the Black* which appeared in the July issue.

Like Mr. Granger, I too am pleased that cash receipts from national forests exceeded cash expenses of administration and of capital improvement in fiscal 1951 and 1952. Like Mr. Granger, I agree that attainment of high levels of income should not be the primary objective of public land management. But, if publicly-owned resources which pay neither taxes nor interest charges cannot yield a cash surplus, even with modest expenditures for capital improvements paid out of current income, how can we expect privately-owned forests and range lands to bear higher costs such as taxes and yet return a profit? If we as public land administrators cannot show a net cash return from the lands we administer, what business have we telling private industry how to manage its resources?

Lands and resources under the administration of the Bureau of Land Management and its predecessor agencies have returned more money than spent by those agencies in each year since, 1905, more than twice as much in 42 of the 48 years, and for each of the past five years have returned more than five times as much. . . . A large part of these receipts is from oil and gas royalties and rentals. However, forestry operations for many years have returned more than four times expenditures, including capital improvements.

In the November issue we printed a highly interesting controversy in this column with ROBERT D. WRAY, author of *Be Your Own Guide* (June issue) and J. V. K. WAGAR, head of the Forest Recreation and Wildlife Conservation Department of the Colorado Agricultural and Mechanical College, Fort Collins, the protagonists. Recently received was another letter from Mr. Wagar refuting some of the views expressed in Mr. Wray's letter last month, a copy of which he also sent Mr. Wray:

Two statements in Mr. Wray's letter of October 10 accuse me of beliefs I do not entertain. Another unfortunately introduces an attitude towards outdoor recreation which needs to be removed from consideration herein.

Mr. Wray writes: "Mr. Wagar feels that using aerial photos for recreational purposes violates the wilderness principle." I

(Turn to page 37)



## Proud Sign of a Pioneer

The Champion Paper and Fibre Company, one of the earliest supporters of the Tree Farm Movement, is justly proud of this recently erected sign on a property which it has managed for forty years. Like all Champion forest farms, this huge reservation is carefully tended by expert foresters whose knowledge of their trade provides assurance of effective reforestation, the virtual elimination of waste, and a continuing supply of strong, healthy trees.

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## WASHINGTON LOOKOUT

By G. H. COLLINGWOOD

**The Missouri River Basin Agricultural Program** is one of several controversial projects which the new Republican administration has inherited. In view of the party's opposition to valley authorities it might appear that such a plan would hold favor in coming developments.

This plan was formulated by the Department of Agriculture, submitted to the 81st Congress in 1949, and printed as House Document No. 373. It proposes to focus the facilities of the Forest Service, Soil Conservation Service, and all other agencies of the Department upon the up-stream problems of the great Missouri River Basin.

Any plan to cover one-sixth of this country's land area in 10 states must be big, and this is no exception. It proposes expenditures, over a period of 30 years, of more than three billion dollars in federal funds, and nearly five and a half billion dollars in state, local, and private funds.

Chairman Harold D. Cooley, Democrat of North Carolina, introduced a bill to approve and authorize the program, and the House Committee on Agriculture held brief hearings on it but nothing was printed. Accordingly, it received little serious consideration by either house during the 81st Congress. A single effort to bring some phases of it before the 82nd Congress was made by Representative W. R. Poage, Democrat of Texas. His bill, H. R. 8342, was described in House Report No. 2222 but again, no action was taken and the program remained only an expression of departmental plans.

**Undaunted by the** lack of attention by two Congresses, Agriculture Secretary Charles F. Brannan chose the last days of the 82nd Congress to rush a supplemental report to House Speaker Sam Rayburn, Democrat of Texas. This amplifies the original plan by providing details concerning up-stream problems in five strategic watersheds, and like the original report, was referred to the Committee on Agriculture. It was printed under date of July 4, 1952, as House Document No. 530.

Of the several comments and criticisms of the first report, by heads of

the several government agencies operating in the basin, none more clearly foreshadowed the difficulties and delays to which it would be subjected than a letter signed by Major General Lewis A. Pick, Chief of Army Engineers. With a minimum of words, he indicated how this relatively new program must fit with "the coordinated plan for flood control, navigation, irrigation, hydroelectric power development, and related water uses now being prosecuted by the Corps of Engineers of the Department of the Army and the Bureau of Reclamation of the Department of the Interior."

The Missouri River Basin is an arena where three great Federal agencies work to control water and make it available for public use. Only the most careful planning and coordination can keep them from treading on one another's toes. To this may be added the possibilities of misunderstandings within the legislative field.

**For example, it** was natural for a communication from the Secretary of Agriculture to be referred to the Committee on Agriculture. But if it deals with the control of floods, the Corps of Engineers has a basis for interest and the Committee on Public Works normally receives such bills. And if water is to be impounded for irrigation purposes, the Bureau of Reclamation must be considered, and with it the Committee on Interior and Insular Affairs.

Confusions of this sort were supposed to have been avoided by the Flood Control Act of 1936, but the repeated delays which have confronted consideration of the agricultural program raise questions as to the flood control act's effectiveness. House Document No. 530, described as the supplemental report on the agricultural program, appears to be an attempt to clear up confusion as to agency responsibility, by giving specific details on five of the watershed plans.

The South Platte River Basin is one. It is a timely example of the age-old dependence of civilization and human institutions upon forests as sources of life-giving water. This watershed is about the size of the

State of New Hampshire. It extends south from Wyoming about 170 miles into Colorado and east about 80 miles from the Continental Divide.

**The city of Denver** and a rich agricultural valley that supports such communities as Fort Collins, Boulder, and Greeley are within its borders. The inhabitants enjoy a climate of low humidity with successions of sunny days because most of the water necessary for their lives comes from snow and rain that falls on neighboring mountains and foothills. They get it from the South Platte River and from supplementary aqueducts. The mountains and foothills are largely within the Roosevelt, Arapaho, and Pike national forests, the Rocky Mountain National Park, and areas administered as grazing units by the Bureau of Land Management.

Regardless of whether it flows from tributaries of the South Platte River or is channeled through the Moffat tunnel, practically all the water for this region is derived from national forests administered by the Department of Agriculture, or from national parks, national monuments, public grazing lands, or Indian lands administered by the Department of the Interior. Some of the differences resulting from these interlocking patterns of responsibility are revealed in correspondence included in the two reports.

For example, the Secretary of the Interior refers to the proposed capital improvements on national forest and forest range lands as excessive in proportion to the economic value of the resources. He points out that these would average about \$43,000,000 annually over a 30-year period. Justification for such expenditures, he says, "must rest upon improvements in watershed, wildlife, and recreational values which are difficult to determine or support."

**Not only does** Secretary Brannan agree to this but he stoutly defends the watershed values, saying, "On some of the forested headwaters of the Missouri River watershed the recreational values are certainly of more importance than commercial use of timber and forage. Recent studies indicate that, for the country as a whole, the lion's share of all national forest values may be attributed to their function as watersheds, and that their recreational and wildlife resources, which yield practically

(Turn to page 45)



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Uphill logging is demonstrated on Weyerhaeuser Timber Company's tree farm at Vail, Washington

A new steep-slope method forces trees to topple uphill, virtually eliminating breakage and splits caused by a longer, downhill fall

By ALBERT ARNST

**C**ONSERVATION - conscious loggers in the Pacific Northwest's Douglasfir region have mastered a new trick in felling old-growth trees.

As a result, the traditional "Timber-down-the-hill!" chant which for nearly a century has echoed through western forests to signal the drop of another mature tree giant may soon be replaced by a modernized 20th-century version, "Timber - up - the - hill!"

This revolutionary method of tree felling literally repeals Newton's law of gravity. The new technique, used on steep topography, drops 200-ton Douglasfirs to the ground without breaking their 150- to 200-foot-long columns of precious wood fiber, matured to choice quality by Nature during life spans of 300 to 500 years.

Split or shattered tree lengths, resulting from too terrific impact with the ground, mean fewer 32- to 42-foot logs. Fewer logs mean a waste of premium-grade and priced raw material required for high-value lumber, select plywood faces and large structural timbers. Waste of this raw material hurts Oregon's and Washington's number one industrial payroll.

Although speedy power saws have replaced cumbersome hand saws, there has been no basic change in the *method* of felling trees since

## Timber up

Tree in background is on its way over, will drop parallel to road in easy yarding position



America's pioneers first slashed farms out of timber-covered lands. The logger has always bowed to Newton and his changeless law. A tree's direction of fall has been determined largely by its "lean" or tilt from an imaginary vertical line.

In a natural old-growth forest, particularly Douglasfir, few trees reach maturity standing "plumb" or straight with the world. Most have a gravity-poised lean which literally balances 150 to 200 tons of dead weight in the air until the faller severs the anchoring wood fibers. The tree then falls in the direction of major lean. The faller usually can do little to alter that predetermined falling path, except in cases of slight lean, where wedges driven at stump level shift the balance point, or center of gravity.

Weyerhaeuser loggers, among others, thought something could and should be done to salvage this "unavoidable" waste in logging. The prize was well worth the effort, because tree breakage in logging may exceed 15 percent of the cruised merchantable volume per acre. Experimental work was begun by loggers with radical ideas on how to upset Newton's inviolate law of gravity.

The result is a new tree felling technique, first developed at Weyerhaeuser's Vail, Washington tree farm in 1949, under the supervision

of logging superintendent Buck Reichel. But logging superintendents Clyde A. Corman at Weyerhaeuser's Longview branch and Charles W. Preppernau at Weyerfield, Oregon, weren't far behind Reichel in putting the new log conservation technique to work on their own mature timber areas.

Today the method has been proved a sound, good, safe and practical logging practice. Industry men who have seen the new logging technique hail it as holding a real promise for stretching the Pacific Northwest's nine million acre supply of choice and ripe old-growth timber.

Called "uphill tree felling," "tree pulling" or "uphill tree felling with cables" by those who have witnessed the process in action, the new-timber-toppling trick is indeed a revolution in felling trees growing on steep topography.

As used by Weyerhaeuser, the technique mechanically forces 200-ton Douglasfir "leaners" growing on steep slopes to fall *uphill* instead of *downhill*. In toppling uphill, the tree's 150- to 200-foot trunk falls through a smaller arc, and therefore suffers less shattering impact with the ground. All or most of the tree remains in one piece and can be bucked into sound, split-free logs, 32 to 42 feet long.

Uphill felling is only part of the

board-foot saving treatment given by Weyerhaeuser loggers when they harvest mature timber. Designed to stretch supplies of premium grade old growth Douglasfir and hemlock, the over-all package treatment at Vail, for instance, consists of prelogging and progressive logging, the latter being a multiple harvest which may be repeated several times from one spar tree setting. Uphill timber felling is an integral phase of progressive logging.

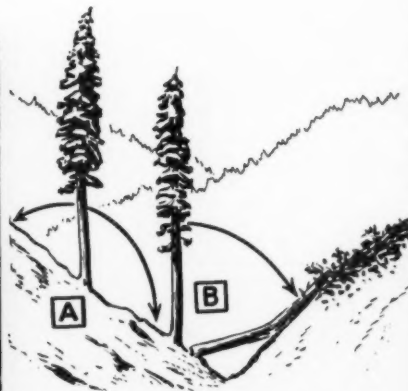
The first harvest in progressive logging is prelogging, carried on with light, portable equipment, such as mobile yarding towers. Prelogging removes the understory of small diameter hemlock and cedar which normally is damaged or destroyed in the big log harvest.

With a yield of from five to 30 cords an acre of pulp-grade logs, prelogging is done before the spar tree is rigged. Yarding distances range from 400 to 700 feet on each side of the logging road.

After the conventional spar tree has been cable-rigged, and before any of the big standing timber is felled, a clean-up harvest is made of large windfalls with merchantable volumes. Logging crews may move along a road for several spar-tree settings, yarding out only the down stuff at each landing and leaving the block-hung spar trees standing for

## r up the Hill

Breakage of this 16-foot timber caused by downhill felling represents \$120 loss



Falling with natural lean across ravine means tree has farther to fall, hence is more likely to break

The Douglasfirs with not a break show advantage of uphill felling





Some trees are vertical, but many lean to one side and fall in that direction

the succeeding phases of the big log harvest, which follow within a short time.

After the ground has been cleaned of the big down stuff, which can shatter falling trees, felling crews move in for the more extensive harvest of sound, green timber. It is here that uphill felling or tree pulling is put to greatest use in salvaging the maximum merchantable volume from each tree as it drops to the ground.

Only enough timber is felled at any one time to permit maximum saving of volumes before more trees are dropped. Several fellings may be made on an area before a seed-tree surrounded block of timber has been clear-cut.

"Tree pulling is a way of buying time," says John Wahl, Weyerhaeuser's logging manager at Tacoma. "The forest industry has several million acres of young stuff, less than 50 years old, coming along in good shape to supply mills of the future. If we can give this new forest an extra five to seven years of growth by making our mature timber last longer, we'll be just that much ahead. Uphill felling is a practical way of stretching old growth timber supplies. It means we can log fewer acres to meet our present mill requirements."

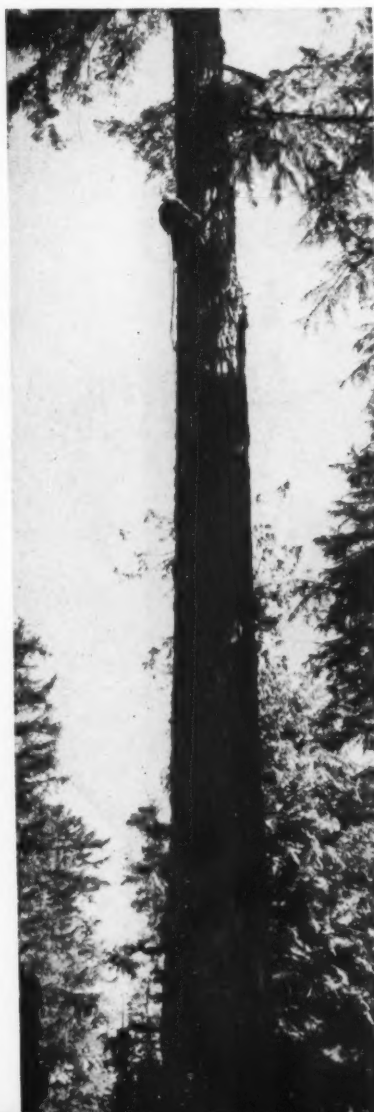
Foresters back up that statement with dramatic statistics. They know the average annual growth of second-growth Douglasfir forests is

about 500 board feet an acre. If in felling an old growth tree, it is possible to save from shattering the equivalent of one log 32 feet long and 48 inches in diameter, foresters have gained 3000 board feet, or six years of growth on an acre of young forest.

Multiply that bonus by many more trees an acre and by the number of acres logged annually. The volume of savings, expressed in acres of growing forest, is both impressive and realistic. That's why loggers and foresters are enthusiastic about this help-yourself-to-more wood revolution in logging methods.

In uphill felling a five-man crew is used, plus cable rigging and a tractor equipped with double drum winch. A bulldozer blade on the tractor is convenient, but not necessary. The crew consists of one set

Climbers fasten the pulling line. This is first step in felling the tree uphill



of fallers, a rigging man, a high climber and a tractor engineer. A set of buckers sometimes is used on the same team.

The felling operation is comparatively simple. After the prelogging and windfall harvests have been made, a tractor is run in on the specially constructed access road at the top of the hill and positioned, double-drum end pointing in the direction of the first tree to be pulled.

Special anchorage is not needed, because the cable pull exerted is not great. The tractor must be far enough away from the tree which is to be felled uphill, so that the machine will be well back of the path of the tree's fall toward it, usually a distance from 200 to 500 feet.

A 5/8-inch cable from the double drum winch is then run downhill to the tree and carried aloft by a high climber, who fastens it from 60 to 80 feet above ground level by single-looping the cable around the trunk, the cable end being "choker"-hooked to the line. After the high climber descends, the tractor engineer takes up slack on the powered drum winch to tauten the cable.

The fallers now make a normal undercut and backcut with their power saw, an operation requiring about ten minutes. The undercut, however, is made on the uphill side, regardless of the fact that the tree may be leaning downhill. The slanting undercut governs the tree's direction of fall.

When the backcut has been put in far enough for the tree to approach falling readiness, the tractor engineer is signaled with the conventional horn, hand or whistle system. He carefully takes up more tension on the cable, while the fallers give their new "timber up the hill" chant and put in the last bite on the backcut.

As the tree starts to go over slowly, the cable is tautened and helps pull the tree uphill. Once the tree attains "full flight," the cable tension is released and the wire rope is allowed to fall free, to be unfastened for re-use on the next tree.

With slight shifts in position the tractor can pull several trees from its first station, working around in an arc as determined by topography. Pulling distances may extend from 700 to 800 feet from the tractor. The machine is then moved to another position on the access road and a new group of trees is pulled uphill.

The felling crew works progres-





Medium weight tractors like this one are heavy enough for tree pulling operations

sively downhill, dropping selected timber uphill into a felled timber area as they go down the slope. Because uphill falling is a part of progressive logging, the falling crew may go over the area several times, from top to bottom, on a modified selection basis. Trees felled may be yarded out before another area-wide felling is made.

The number of area-wide fallings necessary is determined by the amount of timber that can be saved each time. The clear-cut hillside presents a distinctly radical appearance in felled timber. Tree trunks are not criss-crossed, but point uphill in a neat and almost parallel formation. There are no buckers' "jack-pots" caused by trees felled in all directions, as is normally the case.

According to safety engineer Paul LeRoy at Vail, the safety record for this new method of timber falling has been very good, even though the hazard of exposure has been increased an estimated 40 percent. The men work as a closely-knit team. With an adequate system of signals, there has been no particular problem in accidents. Practical men are needed in such an operation, and only individuals of good judgment are used.

Logging Superintendent Reichel estimates that the tree pulling technique is applicable on about 15 percent of the Vail logging area. This percentage is about the same on the

St. Helens (Longview) and Calapooya (Springfield) tree farms. At Vail, from one to two crews work regularly on uphill tree falling.

An average day's output of the logging team overruns the scale of a normal set of fallers. Biggest pay-off is in rough, canyon-studded terrain, where in normal falling almost all the tree may be lost through shattering.

It costs more money to log this way, say Weyerhaeuser logging superintendents, but the added cost is repaid in the market value of the timber saved. Several sample plots

checked by Weyerhaeuser's cruising department bear this out.

One six-acre tract on a steep hillside came out with an overrun of 15 percent as a result of uphill logging. On a second 12-acre plot—on much rougher ground—about a 20 percent overrun in timber cut was effected by uphill falling. On some trees the falling technique saved about 225 lineal feet of logs, or all the tree. This new timber-hoarding method of logging saves about one section of timber for every six logged.

There are many other benefits, say the logging superintendents and foresters. Progressive logging and uphill falling reduce slash hazard and also lower fire protection costs—big items in present day tree farming. Slash fires required by state law aren't as hot, because they have less fuel to consume.

This maintains better site conditions for natural reseeding and subsequent growth of trees. There is also strong public support for this type of timber harvesting, because it conserves the Northwest's supply of premium grade logs.

Special crews doing uphill logging are proud of their pioneering technique. They point to field records of whole trees saved by uphill falling—with occasional big-tree volumes running as high as 20,000 board feet. There are many examples of a normal three-log tree being made a six-log tree by uphill falling—and that's a real payoff in old growth timber.

Wahl sums up the advantages of uphill falling in one sentence. "Sure, the forest industry has a good backlog of old growth stands, but why waste it by dropping it in canyons?"



Skilled two-man crew which rigs the trees to be pulled over by cable-equipped tractor

Set of logging wheels in front of barn that will become museum for display of old lumbering relics ▶

This steam engine of the Nahma & Northern line once hauled logs into the lusty sawmill town



## Come the Modern

**N**AHMA and Hiawatha, two names well-remembered by the many readers of Henry Wadsworth Longfellow's Indian epic, are now closely and promisingly linked in the 20th century epoch of the one-time sawmill town, Nahma, located at the mouth of the Sturgeon river and the gateway to the Hiawatha National Forest in Upper Michigan.

Nahma (the Indian word for sturgeon and pronounced Nay-ma by the natives) is the famous "town for sale" which was purchased lock, stock and barrel in September, 1951, by the American Playground Device Company of Anderson, Indiana. Nestled in a scenic, wooded area along the sandy shores of Big Bay de Noc, Nahma is just off Highway US-2, about 35 miles east of the rushing Escanaba and the thriving metropolis of the same name.

The purchase saved Nahma from

a ghost town fate, after its only industry, the big red sawmill of the Bay de Noquet Company closed down after 70 years of lumbering operations. Probably it was a good Indian omen that Nahma's revival as a community coincided with the comeback of the sturgeon, Nahma, for during the winter Big Bay de Noc fishermen caught several of the giant fish. In the early lumbering era, sturgeon were caught in abundance, but in the more recent years were virtually extinct.

Back in 1881, George Farnsworth, Oconto, Wisconsin lumberman, and his associates organized the Bay de Noquet Company and acquired 200,000 acres of timber land in Delta, Schoolcraft and Alger counties in the middle portion of the Upper Peninsula. The vast forest extended northward from Big Bay de Noc, an arm of Lake Michigan, to the shores of Lake Superior (Gitche Gumee).

Most of this area is now a part of the Hiawatha National Forest, established by President Hoover's proclamation on January 16, 1932. The Bay de Noquet Company erected a sawmill at the mouth of the Sturgeon river at Nahma. In the early years the timber was cut in the proximity of the river and floated downstream on the spring drives.

In 1887, the Soo Line Railway built its Peninsula Division line from Minneapolis to Sault Ste. Marie. At the turn of the century, the Bay de Noquet Company laid its tracks for the Nahma & Northern Railway to connect with the Soo Line at Nahma Junction. This logging railroad was projected northward to the sites of new logging operations in the succeeding years until the N&N had 75 miles of trackage in its heyday.

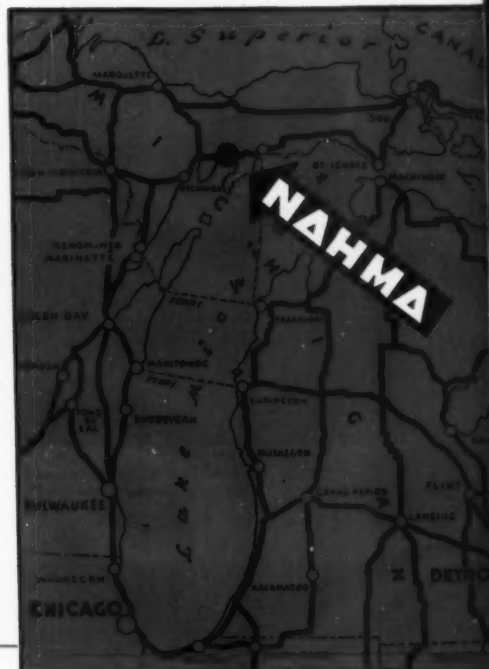
A few years ago, the end of a lusty lumbering era was in sight. The N&N pulled up its tracks in the cut-over country, leaving only the few miles between Nahma and Nahma Junction. Then, trucks hauled the logs from the Grand Marais area on the shore of Lake Superior to the mill at Nahma until the last timber

Nahma, Michigan's famous logging "town for sale" bought last year by a playground device manufacturer, is taking a new lease on life as a model outdoor recreation center





Tree planting projects by Nahma Boy Scouts help perpetuate forests surrounding town



# Modern Hiawathas

By WILLIAM J. DUCHAINE

was delivered early in the summer of 1951.

The big red mill sawed its last log on July 26, 1951. Earlier that year, Charles E. Good, president of the Bay de Noquet Company, decided he would do something to prevent Nahma from becoming just another ghost lumbering town, with its depressingly familiar boarded-up homes and weeds growing in the streets.

Mr. Good launched a nation-wide advertising and publicity campaign in which he offered to sell the entire town of Nahma for one-tenth of its real value to any concern that would establish an industry there. The offer also included 4300 acres of forest land adjoining the townsite, a nine-hole golf course, five-mile beach and the Nahma & Northern Railway. He wanted Nahma to continue to provide homes and livelihoods for the 450 residents.

Inquiries—more than 300 in all—came by letter, telegram, telephone and personal call. In September, the people of Nahma joyfully went to a town meeting at the community center to hear Mr. Good make the offi-



ABOVE—Planing mill of the Bay de Noquet Company will be used for the woodworking department of the playground device firm.  
BELOW—Nahma is located at the gateway to Hiawatha National Forest, one of the outstanding deer hunting areas in Michigan



cial announcement that Nahma had been sold to American.

A couple of weeks later, the townspeople held a reception for Mr. Warren P. Miller, president of the Indiana concern, a happy event that was covered by Life magazine. In a brief talk, Mr. Miller outlined the com-

repairing and repainting the dwellings, general store, hotel, community center building and other properties.

The year 1952 marked the transition of Nahma from a lumbering to a new type of industrial community—where iron, steel and wood will

American equipment actually being tested by healthy, vigorous American youth," said Norman R. Miller, vice president of the company. "Nahma's model playgrounds will be both our testing laboratories and animated showrooms."

While steel pipe and other metals are used to a great extent in the production of American equipment, a considerable amount of wood goes into the making of merry-go-round platforms, diving boards, see-saws, swing seats, picnic tables and park benches.

The 4300-acre American Playground tract, lying between Highway US-2 and the shores of Big Bay de Noc, and bisected by the winding Sturgeon river, is being enrolled in the Michigan Tree Farm system. Under this program, approved timber management practices will be followed to protect and rebuild the forest and provide cover for wildlife. Someday, it is hoped that the company will be able to supply some of its manufacturing needs from its own forest.

Taking an early start in this direction, the American Playground Device Company immediately put a crew of men at work disposing of the slash left by the final logging operations of the Bay de Noquet Company. In addition to reducing the fire hazard and beautifying the roadsides, the slash disposal project furnished much-needed fuelwood for the central steam plant, which heats several commercial buildings and operates the town's water system. Sawmill waste was previously used for fuel purposes.

Before the Bay de Noquet Company began operations in 1881, there had been a small sawmill on the banks of the Sturgeon river, a short distance from where St. Andrew's Catholic Church now stands.

The Armistice Day storm of 1940 damaged much spruce, balsam, Norway and jackpine timber, which was salvaged as pulpwood by the Bay de Noquet Company. During the last two winters before the mill closed down, jobbers for the lumbering concern cut about 1,750,000 feet of sawlogs—white and Norway pine, jackpine, hard maple, yellow birch, soft maple and ash and oak. About 3500 cords of spruce, balsam, pine, poplar and hemlock pulpwood and a small number of cedar ties were also produced in the closing year.

Timber of less than 12 inches in diameter was left standing. No cutting of pulpwood was done within

(Turn to page 30)



A familiar sight when sawmill was in operation, these logs and lumber piles will be seen no more in Nahma



Charles E. Good, left, Bay de Noquet Company president, shakes hands with Warren P. Miller, whose firm bought town

pany's plans to develop Nahma as a model industrial-recreational community.

All former Bay de Noquet Company employees, willing and able to work, were given jobs when the American Playground Device Company assumed complete charge of Nahma on January 1. Former sawyers, filers, lumber shovers and other sawmill workers were put to work

combine to produce the finest swings, slides, merry-go-rounds, climbing structures, horizontal ladders, and other recreational equipment.

A model playground will be installed near the Nahma school. Water slides, diving boards and other aquatic sports equipment will be set up at the fine, sandy beach.

"Nahma will provide an opportunity to our many customers to see

☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆  
 ☆ **THE NATION'S** ☆  
 ☆ *Christmas* ☆  
 ☆ **TREE** ☆  
 ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆

**C**AN you imagine climbing 267 feet to pin a tinsel star atop your Christmas tree? Or stringing the traditional holiday lights around a green-boughed giant whose lowest limb towers 130 above the ground?

It would be quite a task, but it has been done—figuratively, at least—every Yuletide since 1925 when the General Grant Tree, a California Sequoia gigantea, was officially dedicated as America's Christmas Tree.

Twenty-seven years ago when a group of interested citizens of Sanger, California conceived the idea of establishing a National Christmas Shrine they looked for a tree whose size and age would make it a fitting symbol of the great spirit of Christmas. The majestic General Grant, located in the Grant Grove of "Big Trees" in Kings Canyon National Park, was such a tree. Each year since its dedication this 3500-year-old redwood has been the center of Christmas festivities—both patriotic and devotional.

And in the minds of the many persons who have attended these ceremonies, and in the imaginations of those to whom the General Grant has become a living symbol, the great Sequoia is as brightly bedecked with holiday ornaments as the elegantly trimmed tree in your living room.

Soon after the General Grant was designated as The Nation's Christmas Tree a Nation's Christmas Tree Club was formed. At the beginning this club consisted only of those who had attended a Christmas service under the tree. But later, as interest in the club grew, membership was extended to anyone who was interested in the perpetuation of the ideal.

Then in 1943 a Big Tree seed card was inaugurated and soon was on sale at gift shops and greeting card stores all over California. The card, now widely circulated, carries a packet containing about 25 seeds of the Sequoia gigantea, and anyone who plants a seed becomes a member of the Nation's Christmas Tree Club.

Since the seed packets have been distributed all over North America the club has grown into The Nation's Christmas Tree Association, which offers honorary memberships to anyone interested in the aims and purpose of the association. Members feel that the growing membership of the organization and the tremendous circulation of seeds prove that the Sequoia gigantea grows successfully in many parts of the United States.

Hence, the association is continuing to assist promotion of the use of live, fire safe, Christmas trees everywhere.

☆ **The General Grant, majestic redwood designated as national shrine in 1925, is center each Yule of patriotic and devotional services**







Forest guards inspect logs taken from the Forest of Zaringul, Province of Gurgon



One of Iran's many charcoal workers. This industry is highly destructive to forests

# Fore

An awakening is taking place in this brooding, strife-torn country. Its people are assessing their forests and other natural resources in preparation for a happier, more orderly future. But changes come slowly here, and the road is long

ARCHAEOLOGISTS delving into the ruins of Persepolis, the ancient capital of Iran, have uncovered charred oak beams of surprising size and, considering their age, excellent state of preservation. On three sides of the city the lone and level wastelands stretch far away; on the fourth is a craggy and barren mountain range. One wonders whether such land ever produced such timber; and, if not, from what ancient woodland it was brought centuries ago.

The hardy, world-conquering Persians who built Persepolis worshipped the forces of Nature and considered each manifestation—whether sun, fire, tree or earth—to be sacred and worthy of the highest respect. Their prophet Zoroaster was a tree-planter and prescribed reforestation as an activity most pleasing to Ahura-Mazda. His followers to this day observe an Arbor Day.

In this tradition walked the late Reza Shah Pahlavi, who founded the

present ruling dynasty and made his capital Teheran, a city of trees.

Since those oaks were felled, hewn, and hauled to Persepolis so many years ago, the course of history has not been kind to Iran. First Alexander the Great with his Grecian soldiers arrived. They burned Persepolis and quarreled over the spoils. Their successors, the Parthians and the Sassanidai, fought a long duel with Rome and then fell before the rising tide of Islam.

A golden period followed. Persian architecture, philosophy, crafts and literature, culminating in the epic poetry of Firdowsi, placed her among the great contributors to civilization.

But her culture and spirit were dealt a shattering blow by the Tartar invasions. They wrecked the country from one end to the other, not once but several times; and they sunk Persia into a long night of poverty and ruin from which she has scarcely recovered to this day.

But now an awakening is taking place. Iran is assessing her human and natural resources and bravely preparing for a happier future.

One of the more important of these natural resources is a forest of 45 million acres, or about 11 percent of the country's area. This forest reflects Iran's history as clearly as do her polyglot people, her special type of culture, and her age-old hates and prides.

Iran is primarily an arid plateau isolated on three sides by high ranges and on the fourth by the Persian Gulf. Across this plateau, in a northwest-southeast direction, run a series of ranges partly covered by forests. The character, history and uses of these forests are quite distinct from anything familiar to the United States.

How extensive or productive they once were is a fascinating question. Suffice that they have been under a regime of intensive grazing so long that they now appear as scattered,

# ests of Iran

By HENRY S. KERNAN



A typical village in the Caspian Forest, an area of superior quality and productivity



Highly destructive and inefficient exploitation has ruined much Iranian forest land

park-like stands under which reproduction, undergrowth and duff are entirely lacking.

These open, arid forests have an area of approximately 37 million acres. Two-thirds is covered by a species of oak (*Quercus Persica*) whose abilities to sprout and resist drought and grazing are amazing. The other third is about equally divided between the junipers along the Afghanistan border, the pistachios scattered across the central mountains, and a desertic type which survives the most extreme conditions of heat and drought.

Foresters described such areas as distinctly protective rather than productive. They are valuable because they cover the headwaters of streams which are used for irrigation. They can endure light grazing; and they can even supply fuel to the mountain villages in their midst. But they are definitely and positively not industrial forests.

If an unwise public policy opens

them to the insatiable fuelwood and charcoal markets of such growing cities as Shiraz, Isphahan and Kerman, these forests are most certainly doomed. The rather vague ownership which rests with the State will not be enough to protect them. Furthermore the long-standing rights to grazing and fuel-gathering will complicate their management.

Such arid forests, though important and interesting, are as nothing compared to the magnificent hardwood forest of the Caspian littoral. These stand on the north side of the Elborz Mountains which hook around the base of the Caspian Sea. In this position they intercept the rain-clouds drifting southward.

Their sedimentary and igneous rocks have been folded and eroded into a series of sharp ridges and narrow valleys which rise abruptly from the Caspian Plain and descend almost as abruptly onto the Iranian Plateau. They are dominated and crowned by the majestic, snow-cov-

ered height of Demevand, whose 18,000-foot peak is the highest in Iran.

The resulting combination of high rainfall, mild climate, long growing season, and deep, unglaciated soils gives rise to one of the most amazing forested areas in the world. It is not extensive—barely eight million acres; but its quality and productivity are superlative. What the Douglasfir belt of the Pacific Coast is to the conifers, the Caspian forest is to the hardwoods.

The Hyrcanian jungles were known through antiquity and the middle Ages principally as the home territory of a particularly fierce tiger whose descendents still roam the wild and dank glens. To the long line of conquerors who have marched across the pages of Iranian history, the Caspian forests have been a barrier to military operations whose potentialities for good and evil were not and are not realized.

Only the late Reza Shah Pahlavi





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Lumber camp in Caspian Forest. Boy on the left is the cook



Iranian lumberjack peels the bark from a prime alder log

thought differently. He was a "jangali" (forest-dweller) by origin, and he became fiercely aggressive to acquire woodlands and register them as Royal Domain. At one time he had a personal forested estate of around six million acres. Before his time various rights of grazing had been exercised in the forest; but the land had never been registered as property in the sense that the word is understood in the tradition of Roman Law.

The attitude of the forest-dwellers, be they shepherds, charcoal burners, or small farmers, toward their surroundings, differs not a whit from what might be expected of people in their social and economic status. They look upon the forest much as fishermen look upon the sea or as our early stockmen looked upon the open range.

They consider the forest to be free to anyone who can use it without let or stay of any kind. To expect otherwise is to look for pears on an elm tree. Even talk of restraint or care is considered to be dangerous if backed by authority and contemptible if not.

Each year in the early spring, certain shepherds leave the lowlands where they have passed the winter and move slowly upward through the forested mountains. By summer

they are above the timberline, and here they stay for several months.

Come Fall, they are on the move again and reach their winter homes before the heavy snowfalls. The line of their movements, which is centuries old, can be traced by the usual symptoms of forest grazing.

The forest floor is pounded hard, its foliage is eaten away, and even the branches of the trees are cut off so that every leaf which appears will be within reach of the livestock. These grazing practices are governed by traditions which cannot be changed without the gravest consequences.

The charcoal industry is of more recent origin and has graver implications. In the present and increasing proportions, it dates only from the war years when roads and motor transport suddenly brought large areas of primeval forest into the orbit of a highly destructive and highly inefficient exploitation.

The process has occurred so often in other countries that no one can be surprised to observe it in Iran, or to be unable to predict the future course. The business of making charcoal is nearly unvarying in procedures and results.

A buyer will advance just enough food and tools to keep a woodcutter operating on the verge of starvation.

With or without the stipulated permit from the Forest Service, the cutter chooses a likely spot not too far from a motor road. With a short-helved, narrow-bladed ax, he hacks away at every tree over an area of eight or nine acres.

The small trees are all cut down, and the large ones are stripped of their branches. A fire is often built at the base to kill them and allow more light to reach the forest floor. While he collects the wood and fires it in a crude mud kiln, the family flock of goats moves in and cleans up every scrap of forage within reach.

The waste of wood is itself enormous because for every 20 tons cut, barely one ton reaches Teheran as charcoal. The rest rots away or burns up in the kiln. Worse yet, an irreparable damage is done to the land. The forest is gone for good. The goats never give it another chance. Within a few years it becomes just another impenetrable patch of weeds, vines, shrubs and deformed, rotting trees.

There are perhaps 10,000 kilns operating in the Alborz Mountains day and night year after year. From each the wretched, scrubby wasteland creeps deeper and deeper into the forest, leaving in its wake the most horrible examples of land degradation which it is possible to imagine. The depth can only be realized after a visit to the forests in their primeval grandeur.

These forests are a source of some uneasiness to the Iranian people, whose "forest sense" is certainly not developed to the point where it can cope with the problem of primeval forests under pressure from industry. The Iranians have been told again and again by foreign advisers that they possess a resource of unique qualities and great potential which is being dribbled away. But they are a long way from knowing what to do about the problem.

A Forest Service somewhat along German lines has been set up and given considerable legal power. It functions principally as an agency to issue permits and collect fees. The money so collected is, in theory at least, used to replant forests whose destruction the Forest Service has been unable to prevent. A more futile activity can scarcely be imagined.

The Iranians are the first to admit this situation. They do realize what is at stake and they are making efforts to put a semblance of order and continuity into their forest policy. Certainly anyone who knows them or their forest wishes them well.



*In the Pacific Northwest*

## Minor Forest Products

By ELMER W. SHAW

**F**OREST owners and users in the Pacific Northwest are fortunate. Their forests not only yield some of the finest timber in the world, but they are also the source of a wide variety of sideline products that provide a welcome income while the trees are growing.

In the cool, damp, Douglasfir forests west of the Cascades, and even in the drier pine country of the East-side, there flourishes a veritable host of so-called minor forest products.

The more important ones are:

Christmas trees; evergreen boughs and pine cones for holiday decorations; native, florist's greens such as sword fern, evergreen huckleberry, and salal; dozens of plants used in the crude drug business; cascara bark; berries; burls; Oregon balsam (Douglasfir pitch); tree seed; cones and various novelty items.

Woodlot owners and forest managers should provide for the system-

atic harvest of these minor products as well as the main timber crop. It is good multiple-use forestry. But many owners fail to recognize the present and potential value of these incidental products.

Even though they are generally classed as "minor" forest products, some of them have been developed into major industries. For instance, the Christmas tree business in the Pacific Northwest supplies approximately one-seventh of the nation's annual demand. Even more spectacular is the harvesting and processing of decorative, florist's greens—a year-round industry estimated at five million dollars.

Young stands of Douglasfir can often be profitably managed as a Christmas tree farm. But conditions  
(Turn to page 42)

Choice sword ferns from the Pacific Northwest are carefully checked before being crated for shipment to all parts of the United States



A fern picker and his jalopy—a familiar sight in Douglasfir forests of the Olympic Peninsula, where minor products are a going concern



Bunches of minor forest products—sword fern, salal and evergreen huckleberry—are displayed by the author





The 13-year-old Alabama Forestry Council is a working illustration that various segments of the forest industry can and do work together

By KENNETH J. SEIGWORTH



Thriving longleaf pine plantation at Tuskegee Institute exemplifies growth of good forestry practices in Alabama

## GUIDING

# 'Bama's

## FOREST

## DESTINY

IN Alabama, as elsewhere, a large number of federal, state, and county agencies have authority to do something about forestry. Whether these agencies "work together" and how they cooperate with private forestry interests are questions of major social, economic, and administrative import.

The Alabama Forestry Council is a working illustration that these various segments of the forest industry *can* and *do* work together. The history of this 13-year-old organization and its somewhat different approach merit study by other states aiming for coordinated use and development of their natural resources.

Forestry is Alabama's third largest







Council Members W. A. Belcher, left, and D. E. Hampe discuss problems in the field



A demonstration of pine seedling planting is one of the many educational projects that have been instituted by the Council

industry; only steel and textiles outrank it. Annual value of business is about half a billion dollars. Products include lumber (2 billion board feet), pulp and paper (4 large mills), poles and naval stores. Forestry is a major source of income, employment, and taxes.

Forest land covers 19 million acres—60 percent of the state's total area. While most forest land is in private ownership, substantial areas are in federal and state holdings under several separate administrative agencies—national forests, military establishments, state forests, TVA reservoir lands, national wildlife refuges, state school lands. The state spends close to a million dollars a year on forest fire protection alone, exclusive of the federal lands. Governmentally as well as industry-wise, forestry in Alabama is a big, vital business.

State agencies interested and active in forestry include the Department of Conservation, Alabama Polytechnic Institute, and the Department of Education. Federal agencies involved are the U.S. Forest Service, Soil Conservation Service, Tennessee Valley Authority, and Production and Marketing Administration. Of these seven major agencies, five manage public lands; five

are engaged in forest research; all encourage and support better forestry practices by private citizens.

In addition to the public acts that established these agencies, they are influenced by such cooperative federal legislation as the Clarke-McNary, Norris-Doxey, McNary-McSweeney, Smith-Lever, and Bankhead-Jones acts. These are further supplemented by policy and administrative practices which tend to have the influence of law. This is the complex situation in which the Alabama Forestry Council has evolved.

That a high degree of coordination has been achieved is noteworthy. The Alabama Forestry Council is due some of the credit for this. There are now forestry councils in some of the other states (Mississippi, South Carolina, North Carolina, Florida, West Virginia), but it is believed that the Alabama Council is unique in life span, status, organization and operation.

It is difficult to define the Alabama Forestry Council. The answer, like a definition of the British Constitution, is not found in a single organic document. As one of its early members I can more readily identify some of its characteristics. And yet I am sure the substance is much more

than this. It is designed to provide a healthy atmosphere where the forest products industry and public forestry agencies—state, local, and federal—can express, examine and reconcile their various points of view. Membership, although limited, provides a full cross-section of interest and viewpoint. Current membership totals 39:

It is a forestry organization but not a professional one—only half of its members are technically trained foresters. By education and experience, members represent a wide variety of business and professional disciplines. Range of attitude and thought varies accordingly. Yet there are common conditioners and objectives.

The Council is not a pressure group. Its meetings are akin to forums or seminars. It has no legal status. It was not born in crisis, nor have campaigns kept it going. It was not imposed on its member groups from the outside; they have acted of their own volition. It has had no subsidies and wants none. It has some very positive attitudes, but its work area is broad and flexible. Although it never consciously seeks an issue, the Council has considered

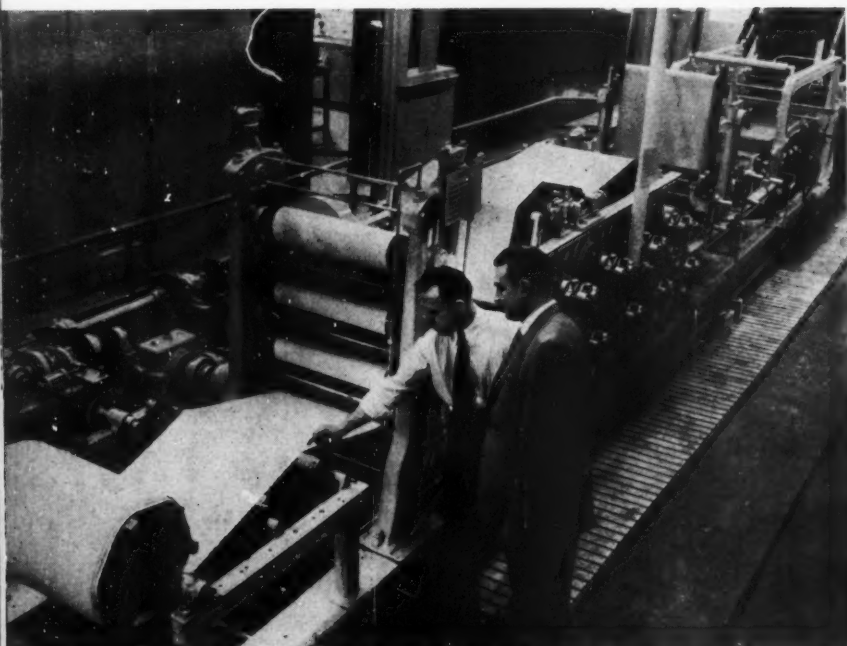
(Turn to page 36)

Stacks of staves—a part of the annual industrial timber output in Alabama



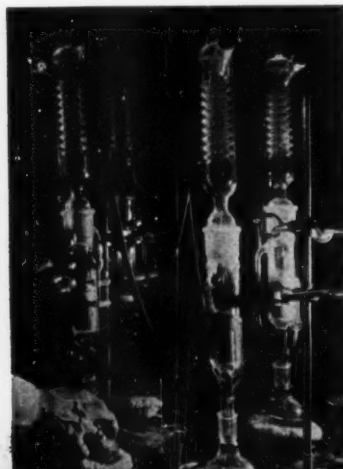
Crown Zellerbach is smoothing out production wrinkles in new pilot plant, the paper industry's most complete

## Giant Jobs with Midget Mill

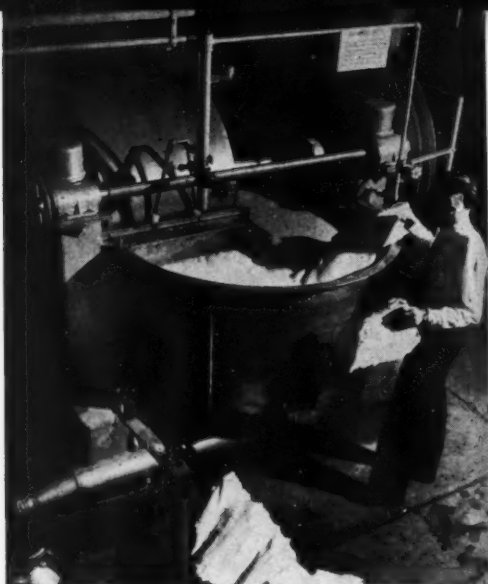


The miniature plant's paper making machine, a fraction the size of commercial giants, can produce paper of any type

Pitch extraction apparatus, used in evaluating pulps made in laboratory



This fiber fractionator, as the name suggests, separates pulp into fibers of different lengths



Pint-size heater fluffs out the fiber, can handle load of 150 to 200 pounds

A NEW development laboratory more complete than any before it in the American pulp and paper industry has gone to work for Crown Zellerbach Corporation.

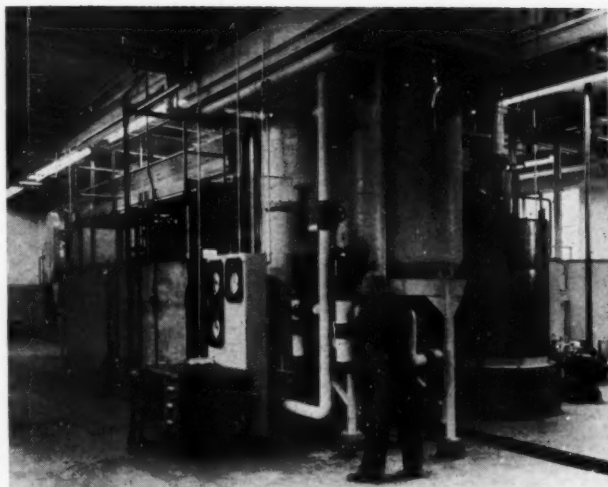
A \$500,000 investment in the industry's future, the new facility offers the West's biggest paper maker the promise of a freshened flow of new products both in papers and from the pulp liquors hitherto wasted.

This new laboratory built beside Crown Zellerbach's huge specialty paper plant at Camas, Washington, boasts a paper mill of its own, complete from chipper to coater but all on a dwarf scale compared to the commercial giants.

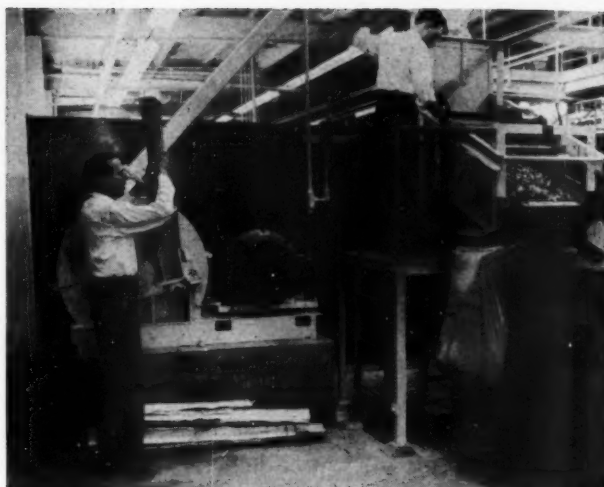
Resembling in size an amusement park railroad, this expensive little mill was constructed for intensely practical reasons. The old laboratory at Camas, established as the company's research center 13 years ago, will continue its work-bench experiments.

The new facility, in its new 200 by 75 foot building, is taking over the job of application. The two have divided up the old staff of 35, which includes eight PhDs, in chemistry and engineering, and have added another 10 or so.

Researchers will turn over new products and the development laboratory will then develop techniques to make them commercially. This has been done many times before, of course, but the miniature mill will speed up the task. It can duplicate all processes of the big plants, hence it will relieve them of making test runs for the experimenters, always a



After stovewood size sticks are fed through laboratory's small wood chipper, the chips go to digester or cooker



Pilot plant digester does same job as big revolving tanks though its capacity is only 300 to 350 pounds of pulp

costly interruption to commercial operation.

Test batches no longer must be hauled to company mills, as far away as 110 miles. In the case of Rezon paper for plywood overlays, the company set up every test run over its five-year study at West Linn, 30 miles away. The lab people say the new unit could have speeded this up by two years.

New ways for "tailor-making" papers to meet special needs will be hastened. Among more recent Crown Zellerbach developments is a fungicidal wrap for citrus fruits to arrest mold.

Wood species not widely used for paper now may be adapted in the new lab. Lodgepole pine, ponderosa pine and other species from the West's inland reaches may be better adapted. Even non-wood sources of fiber can be better studied.

But perhaps of greatest significance is the one-third of floor space reserved for the chemical engineers and any pilot plants they may design for study of pulp liquors. Little more than half the log is cellulose fiber; the rest has been largely lost in liquid waste. Lignins and other materials in the pulp liquor offer an almost untapped commercial resource.

Crown Zellerbach chemists have developed their first market item from this waste in the form of Orzan, derived from ammonia base pulp liquid. It has been found valuable as plant fertilizer, as a dispersing agent in asphalt emulsions, gypsum, clay slips and sprays, as a base for

## By MERLIN BLAIS

synthetic resin plywood glues, and as a binder in fuel briquettes, hardboard and road surfacing.

In its confidence in the future of such items, the company has established an industrial products division. It will develop distribution methods as different as necessary from those in the paper field.

The little mill will help earn its keep commercially, too. It can easily turn out small amounts of certain papers which lack a sizeable market, or can supply samples where runs of a few hundred pounds are sufficient.

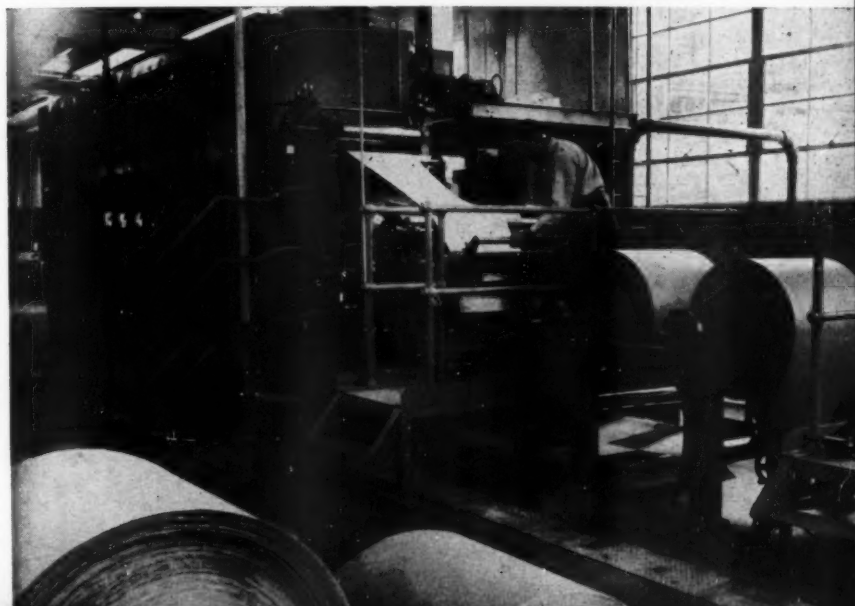
Boss of Crown-Zellerbach research is big, personable Dr. Wendell Moyer, who won wide note in indus-

trial carbohydrate chemistry before joining the paper firm in 1947.

Dr. Moyer reasons that the paper industry has by its own success created the necessity for becoming increasingly complex. Increasing costs of materials has drawn competitors, such as synthetic plastics. Ways to utilize a bigger percentage of the log—its non-fiber components, practically speaking—must be sought in the effort toward greater efficiency.

Crown Zellerbach believes that top-notch research will keep it among the leaders in paper and allied products. This goes hand-in-hand with its efforts to assure a future supply of the raw material, particularly its tree farm program which now embraces 485,000 acres.

This coater and dryer is most expensive unit in C-Z lab. Highly versatile, it makes likely many new and better treated papers







"Professor" A. B. (Bert) Curtis calls the class to order as a new session of the smokechaser school is about to open

**W**OODS-WISE loggers in the Idaho white pines were inclined to snort when they heard about the smokechaser school. True woodsmen, they contended, were born. Never could one be made in any new-fangled smokechaser school in four days!

"Let 'em snort," smiled A. B. "Bert" Curtis, chief fire warden for the Clearwater and Potlatch Timber Protective Associations, which look after around a million acres of our richest white pine forests. Curtis is the principal "professor" in the smokechaser school held each year well in advance of the critical fire danger season.

"Born woodsmen with a built-in sense of direction that works even when they are hemmed in on all sides by tall timber just aren't as plentiful as they once were," Curtis comments. "But we're doing right well with youngsters who go through the four-day training course."

Take the lad from the wide open wheat fields of eastern Washington. Only trees he knew intimately were those around the farm woodlot. At 18, he decided he wanted to work in the woods. Showing eagerness during his early season work in trail clearing, one of the jobs for beginners, he was sent to the smokechaser school. Eventually he wound up on a lookout.

First assignment for that lad was to smoke about three miles from the lookout, beyond the main ridge.

"A woodsman would have sized up the country and gone around that ridge to avoid so much uphill going," Curtis explains. "Had the boy from the wheat fields tried that he might have gotten lost. Probably would. Then we would have had to take fellows off other jobs to find him. But by depending entirely upon his compass and going straight he got to the fire, put it out, and got back."

Old-time woodsmen may still cling to the notion that true woodsmen are born and not made at any training school—no matter how crammed it may be with useful information.

Smokechaser students get last-minute instructions from their teachers before tackling an "exam" fire



Youngsters get lesson in splicing telephone wire from Dwain Space, a veteran in forest protection





# FOUR-DAY

# Woodsmen

**Maybe students at Northern Idaho's smokechaser school don't have the built-in knowhow of born woodsmen, but they do a whale of a job during the fire season**

But at least they aren't talking out loud any more. The fine fire defense record turned in by the boys who operate on techniques learned at the smokechaser school has silenced the skepticism.

During the ten years "Professor" Curtis has called the smokechaser school to order sometime late in June, more than 500 young men have received the intensive short course in modern forest defense. Except during the war years the annual group has been around 50. In each of two years during the war about 100 received the training course. That was because the forest season was particularly critical and danger of sabotage constant.

How are the young men selected for the school?

Here's the answer direct from Professor Curtis:

**By O. A. FITZGERALD**

"We hire young fellows going to high school and college throughout the country. We usually start the new employees on a brush piling job. There they are observed for two or three weeks by the foreman and other protection personnel. When we find a boy that looks as though he would make good smokechaser material, we tag him for the training program. After a short talk to determine whether or not he might return another year and if he is interested in being a smokechaser or in a better job in forest work we give him a chance.

"Of course, we do not like to spend time or money on a boy who will not be with us more than a year. We are interested in finding young men who look to careers in forest

work. In selecting boys for slash piling, we have little difficulty. Our office is in touch with schools all over the country which are anxious to get summertime employment for their students."

Here is one school that needs no campaign for new students.

"When a boy puts in a summer in the Idaho woods he usually tells his friends about it," Curtis continues. "So right after the fire season we begin to get applications for next year. This year, for example, we had three or four times as many applications as we had jobs."

Fifty-four trainees at the 1952 school represented a national roundup. There was one boy from Delaware, another from Washington, D. C. Mid-west states were well represented.

*(Turn to page 33)*

**Knowing how to pitch tent is "must" for the young smokechasers, who often spend night in the woods**



**Embryo fire fighters, equipped only with compasses, get set for running start down mountain flag course**



# Harvard's F

By SYLVAN MEYER

THE weeks, sometimes months, required to compile workable reports on tracts of Harvard University's forest seemed like a lot of unnecessary book work to Richard C. Ross, a young war veteran on the staff to whom "red tape" had become anathema.

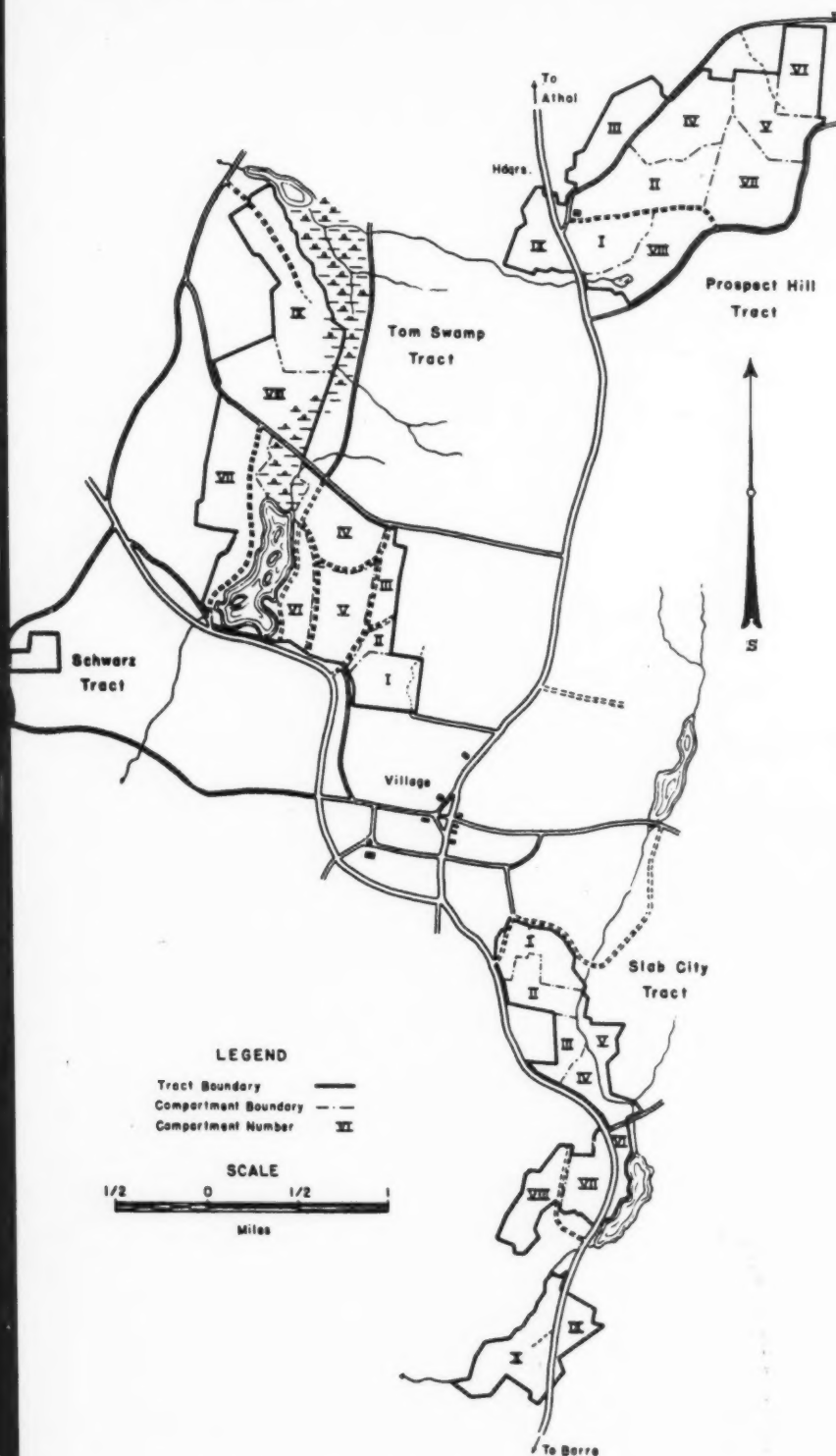
So partly to relieve the tedium of compiling the reports, but mostly to satisfy himself that there must be a better way, Ross devised a simple new system that he thought would save time and improve accuracy.

Dr. H. M. Raup, director of the 2300-acre Harvard Forest at Peter-sham, Massachusetts, thought Ross had hit the nail on the head. In fact, he liked it so well that the Ross system now has been applied to every single acre of the forest.

Though the switchover has taken about three years of off-and-on labor, Dr. Raup feels the trouble and time are amply compensated by the complete and detailed case histories of any given stand that can be set up in only a few hours under the new system. A simple visual filing system has since been added to the records so that case history outlines are available at a moment's notice.

Moreover, the new system is so simple that a person entirely unfamiliar with the forest or the filing system can be taught in a matter of minutes to handle the file or to compile a report.

Records had previously been filed separately for each forest stand. These stands were areas supporting



Using a new method developed by a young war veteran, the University now can set up simple, accurate tract reports in a matter of minutes. A map is used as basic reference



New-type reports give students visiting forest a quick outline of what to expect

## Forest Filing System

a group of trees of a given age and species composition. Experiment and plantation records were also maintained, requiring detailed cross references.

The trouble was that over a period of years—and often not so many years as the layman might think—the kinds of growth in a particular stand would change. Pine would give way to hardwoods; all trees of a certain species would be cleared; a tract might be clear-cut entirely and replanted to new species. Result: a stand that might be split up into several new stands or a number of stands might be merged into one. This required duplication of past records to keep the history of each new stand complete, and cross referencing became complicated.

Harvard's new system keeps track of the land itself. Basically, the common reference is a map. Every job performed on a tract of forest land is designated by letter on a map showing the areas worked over each year. Then a complete report of the job is typewritten and filed according to that designation.

The Harvard Forest is divided into three large tracts: Prospect Hill, Slab City, and Tom Swamp. Each tract is broken up into compartments, and compartments are designated by Roman numerals.

Boundary lines of the compartments conform, as nearly as possible, to easily observable permanent natural features of the topography: perhaps a stone wall, a ravine, a road, or other landmark. But the com-

partment sizes are such that mapped at a scale of one inch to 400 feet, the map will fit on a sheet of regular 8½ x 11 inch paper for convenient filing. Twenty-eight compartment maps were required, but once reproduced, they will not have to be reprinted for years.

Follow through with Harvard on a typical operation. A crew prepares to work in the Tom Swamp Tract, Compartment IV. The forester examines the file for Tom Swamp, Compartment IV, and notes several copies of the one inch to 400 feet scale maps. Each has an outline in red ink inscribing areas of the compartment worked in previous years. In each outline he sees a letter. On the map most recently dated, say 1950, he notes an area marked A and one marked B.

He turns to the back of the file on Compartment IV and finds a typewritten statement marked "A 1950," which reports that on June 11th the area was planted to red pine and Norway spruce as a compatibility experiment. The forester sees from report "B 1950" that the area was merely cleared of brush on September 15th. In a few more minutes of checking the earlier maps, he has in mind a complete history of the section he will work in.

He takes with him the map showing the current year's operations in Compartment IV, and on the job, outlines the area of the compartment in which he will work. He notes that this will make the third opera-

*(Turn to page 41)*

This jaunty lad is not regular guide on field trips, but he looks as if he'd like to be



# YOUR SHADE TREES



## Mechanical ... Injuries to Trees

By R. R. FENSKA

**B**ULLDOZERS and shade trees don't get along together—and the bulldozer usually wins.

A friend mentioned the fact that bulldozers create a lot of work for the tree expert companies. That is so, but it is not the kind of work the tree companies especially care for. No scar on the trunk of a nice shade tree can be made a thing of beauty. At best it leaves a mark which takes years to heal over.

The average operator of a bulldozer doesn't realize the seriousness of the damage he inflicts on a tree when he "just knocks off a little bark." Yet its the same as if he pulled the skin from his finger. In either case it takes a long time to heal.

Furthermore, some people think they are doing a satisfactory repair job by simply painting over the injured area. Some "tree paint" contains chemicals which destroy the delicate growth cambium tissue between the bark and the wood. Better to leave it alone than do further damage to the area.

The most any tree paint can do is prevent decay in the exposed wood long enough for new callous growth to cover the exposed wound. Any solution which causes further "die-back" around the edge of the wound requires just that much more time to heal over with new callous growth.

When bark has been knocked off the tree, the scar should be "bark-traced" (stream-lined) for proper healing. Sap in wood never flows around corners, but *diffuses* gradually at right angles to the flow of the sap stream.

Therefore, if we take a point above the wound and another below it and join them by two gentle curves which include the injured area, we will find that the new callous growth will begin to roll-over the wound from both sides.

When the new growth has completely "sealed-up" the wounded area it automatically stops further decay in the tree. It is then like a skinned finger on which the "scab" has fallen off leaving healthy skin over the wound.

In the case of large scars, the wood tissue must be kept covered with a suitable tree wound dressing to prevent a cavity from developing while the scar is healing over.

Another common injury to trees occurs when the family car knocks bark from trees along the driveway; or along curves on the highways. Sometimes the injury does not appear to be of any consequence until we find a well established decayed

area at about the height of the hub-cap of the car. Such wounds are often neglected until bark-tracing alone is not the answer to the repair of these trees. Tree surgery (expensive operation) is then the only way to save a valuable tree.

Even the lawn-mower has "nicked" pieces of bark from valuable lawn trees which were hardly noticeable until a scar began to show at the base of the tree. Like all small wounds, they are only important if neglected.

When trees of any size are moved, the vulnerable point to watch is the place near the base of the tree where the lifting rope, or cable, is attached. A tree with a sizable ball of earth

(Turn to page 41)

Where machines must mingle with trees, a fence is the best protection for tree ▶

Typical bark injury by a bulldozer—an ugly scar that may take years to heal ▼



AMERICAN FORESTS





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*of road building I did with the TD-24. We took cuts out of hardpan that used to be impossible without blasting. The TD-24 works where other tractors can't go empty and it gets around the steep sides like a bear!"*

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**Forest Management**, by H. Arthur Meyer, Arthur B. Recknagel and Donald D. Stevenson. Published by the Ronald Press Co., New York. 290 pages. Price \$6.

This is a simple, forthright textbook on the management of American forests. "The authors have attempted to bring together in a single volume the basic material on forest management from the standpoint of its applicability to *American* forest practices." This broad objective, stated in the preface, is fulfilled to a remarkable degree.

The authors have limited themselves rather strictly to the subject. The references at the end of each chapter, however, facilitate the location of additional information on related subjects. Parts III and IV will prove particularly helpful to all who are concerned with regulation of a forest or with writing a timber management plan.

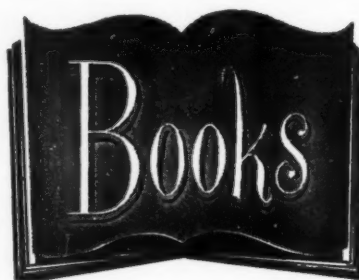
The emphasis throughout is on American conditions, problems and solutions. The authors point to the growing need for management of our forests and present practical ways of achieving the goal of sustained production on individual forests. This book should be of value as a textbook and as a guide for the practicing forester who is responsible for the management of a forest property. —L. S. Gross, *U. S. Forest Service*.

**Stalking Birds With Color Camera**, by Arthur A. Allen. Published by National Geographic Society, Washington, D. C. 328 pages, illus. Price \$7.50.

This new volume is filled with beautiful bird photographs probably the equal of any ever published. As professor of ornithology at Cornell, Dr. Allen has for many years been an ardent and competent photographer of North American birds. In this fascinating book appear 331 color illustrations and 93 black and white pictures of 266 species. It is enriched with a splendid narrative of Dr. Allen's experiences and studies.

**Meet the Natives**, by M. Walter Pesman. Published by M. Walter Pesman, 372 South Humboldt St., Denver, Colo. Fifth edition, 220 pages, illus., paper. Price \$2.25.

This guide book to the flora of the Rocky Mountains provides an easy way to recognize wildflowers, trees and shrubs of the central Rocky Mountain region. It classifies the plants: first, according to the five life



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zones from plains to alpine elevations; second, by the color of the flowers; third, according to the season of bloom. The color lists are indexed for the reader by the unique method of printing a corresponding color strip on the margin of each page. Line drawings and photographic plates add greatly to ease and accuracy in making identifications. This is not a botanist's manual. It is a companion and guide for the outdoorsman, hiker and trail rider who wants to have a speaking acquaintance with plants he meets.

**Tree Clearance for Overhead Lines**, by George D. Blair. Published by Electrical Publications, Inc., Chicago. 235 pages, illus. Price \$4.75.

A second revised edition, this was competently authored by George D. Blair, the former Chief Forester of the Consumers Power Company, Jackson, Michigan. The comprehensive and extensively illustrated textbook contains information about line construction and clearance, tree care, highway and street requirements, regulations, public relations, personnel and equipment, and safety. (AMERICAN FORESTS presented "The Utility Line Problem" on page 20 of the December 1951 issue.)

**Textbook of Wood Technology**, Volume II, by H. P. Brown, A. J. Panshin, and C. C. Forsaith. Published by McGraw-Hill Book Co., Inc., New York. 761 pages, illus. Price \$10.

Here is the second volume of this outstanding two-volume work, which now stands as the only comprehen-

sive text in English embracing all phases of wood technology. The authors have divided the book, topically, into three parts: The Physical Properties of Wood, consisting of the density and specific gravity of wood, wood in relation to heat, moisture, sound, light and electricity, and the bonding and finishing of wood; The Mechanical Properties of Wood, devoted to the basic principles of mechanics as they apply to wood, to the strength properties of solid and laminated wooden members, testing, etc.; and The Chemical Properties of Wood, which are treated from the standpoint of a layman approaching this subject for the first time.

**Fundamentals of Soil Science** (Second Edition), by C. E. Millar and L. M. Turk. Published by John Wiley & Sons, Inc., New York. 510 pages, illus. Price \$5.50.

As in the first edition, this book has a fourfold purpose: to give the reader the opportunity to become familiar with soils as natural units; to help develop an understanding of the significance of fundamental soil properties; to set forth basic relationships between soils and plants; and to make understandable the principles involved in the practical use and conservation of soil. This is a clear, well-organized presentation of soil science fundamentals and integrates the new concepts with the basic problem of how to utilize the soil to best advantage. The authors have supplied excellent illustrations and tabular data to support their facts.

**Empire in Pine, The Story of Lumbering in Wisconsin**, by Robert F. Fries. Published by the State Historical Society of Wisconsin, Madison. 285 pages, illus. Price \$4.

This is the first comprehensive study of the lumber industry in Wisconsin, whose output soared from a few thousand board feet in 1830 to a stupendous four billion feet in the peak year of 1892. Its course was shaped by various, often conflicting, groups — lumbermen, speculators, dealers, transportation companies, politicians and conservationists.

The hazards of operating a business in the wilderness called for more than fair-weather capitalism and arm-chair generalship. These pioneers had need of resolution, for against them were arrayed the forces of primeval nature, of merciless competition, and of economic phenomena beyond their control.

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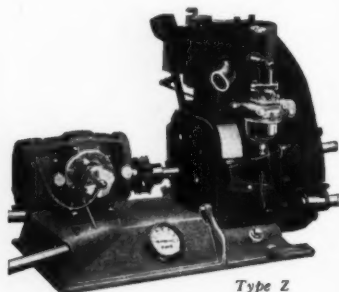
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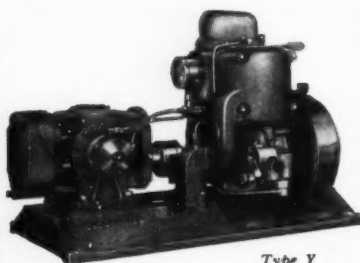
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## Come the Modern Hiawathas

(From page 12)

200 feet of the main roads leading from Highway US-2 into the town of Nahma. A two-mile stretch along the beach, extending from the town-site to the golf course, was also spared. Containing all native species this magnificent stand has been untouched since the pine was cut in the 80s.

All the able-bodied employees of the American Playground Device Company have been enrolled in the forest fire control program in cooperation with the United States Forest Service. Trucks, bulldozers and other equipment of the Nahma firm will be available for use in the event of forest fires in the contiguous Hiawatha National Forest.

While forest fire prevention is counted upon to do the main job of reforesting the cutover portions of the American Playground, it is planned to do some tree planting in the coming years. This phase of the conservation program, incidentally, already has a good start.

About 20 years ago, the Nahma School Forest was established along County Road 497, between Nahma and Nahma Junction, with Norway, white and jack pine and spruce planted on a 20-acre plot. In later years, the Nahma students have planted seedlings on scattered areas of cutover land in the Hiawatha National Forest, a few miles from town.

In 1948, the Nahma Cub Scouts, with the help of their parents and Ranger Jim Jay of the Forest Service, founded the Nahma Cub Pack 422 Forest along County Road 495, near the Nahma golf course.

Tree planting by the Nahma school and Boy Scouts is usually done around Arbor Day and Memorial Day each year. A course in conservation is offered in the Nahma High School, and last spring was correlated with the woodworking class in a novel and interesting project. Students went out woods cruising, scaled timber, felled some trees and skidded the logs out with a farm student's horse. The wood will be used for the making of furniture and other handicraft articles in the school woodworking shop.

In recognition of the strategic location of Nahma and the American Playground within the boundaries of the Hiawatha National Forest, all signs marking spots of historic and

scenic interest will be of rustic design, similar to those used by the Forest Service.

An outstandingly scenic drive, Highway 13, now traverses the forest from Nahma Junction northward to Wetmore, on Highway M-28, just a few miles east of Munising. This smooth, blacktopped turnpike, refreshingly free from unsightly billboards, takes motorists through a vast region of green forests, sparkling lakes and streams teeming with fish, deer, grouse, ducks and other wildlife. On many of the 180 lakes new resorts are springing up each year. Joining them on the south, Nahma hopes to show steady development as a vacation spot.

Present gross acreage of the Hiawatha National Forest is 810,813 acres, of which 469,245 acres are now in National Forest status. The Forest Service has developed 11 campsites, organization camps and other recreation areas. In 1951, recreation visitors totaled 96,000, while hunters in quest of deer and birds approximated 30,000.

The Sturgeon river will play an important role in the recreational development of Nahma. Its headwaters are in the Eight Mile Corners area, where the people of Alger County some years ago erected a tepee-like stone monument to commemorate the founding of the Hiawatha National Forest.

Eight Mile Corners is about 35 miles as the crow flies north of Nahma, but the scenic Sturgeon river zig-zags its way back and forth through the Hiawatha National Forest for about 100 miles before it reaches its mouth at Nahma.

Deadheads—the logs lost in the exciting spring drives of yesteryear—will be removed along with windfalls and other debris to make the Sturgeon river safe for the enjoyment of canoeing and fishing.

North of Highway US-2 the Sturgeon river and its tributary, Eighteen Mile Creek, reward sports fishermen with many nice trout—German browns, speckled and rainbows. Bass, northern pike and bullheads are caught near the mouth at Nahma. In May, the big jumbo perch run attracts hundreds of men, women and children to the old sawmill docks and hot pond.

The Nahma sawmill yards are be-

(Turn to page 32)



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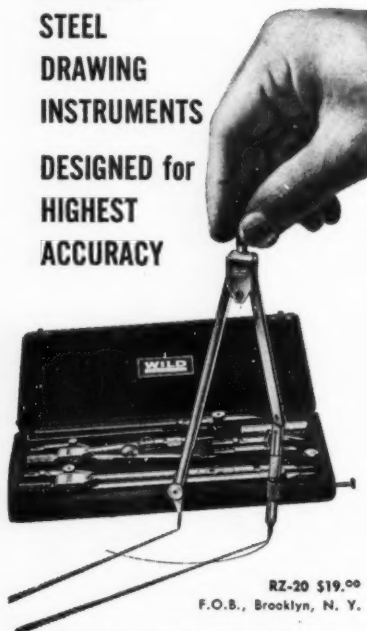
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## Modern Hiawathas

(From page 30)

ing transformed into an attractively landscaped park, where picnic tables, grills and benches will be installed for the comfort and convenience of townspeople and vacationists. Three parallel quarter-mile long slips, which once stored millions of feet of logs, will be transformed into scenic lagoons for boating and other aquatic sports. A huge sawmill burner will stand forever as a landmark and reminder of the old-time lumbering days.

Nahma's historic past also will be preserved for posterity in the museum which will be established by the American Playground Device Company. Canthooks, peavies, travois and other old-time logging equipment will be on display there, as well as Indian baskets, moccasins and other native handicraft work.

The thousands of railway fans throughout America would like Nahma. The old logging railroad, the Nahma & Northern, is being scrapped for salvage, but one steam locomotive, a Russell log car and a McGiffert jammer will be placed in the museum.

With its beautiful and sporty nine-hole golf course amidst pines, nature trails, tennis courts, long sandy beach and other facilities, Nahma will be equipped to cater to pleasure and rest-seeking vacationists. The rustic cottages on the beach have been enlarged and modernized so that each will have two bedrooms, kitchen, bathroom, porch, and knotty-pine paneled living room with fireplace. The Nahma Hotel has undergone improvement.

Just across the wide, shady Main street from the hotel is the new \$100,000 community center building, with its distinctive knotty-pine paneling. The large clubhouse, with well-equipped bowling alleys, auditorium-gymnasium, men's bar, soda fountain, library and conference rooms, is Nahma's recreation center.

Yes, Nahma is bustling again. With hammer, saw, shovel, trowels and paintbrushes, former lumberjacks and sawmill hands are giving the town a cheerful, facelifted appearance. All the homes and commercial buildings are being painted white, the only exception being the office of the American Playground Device Company. The reason: it's the only brick building in town.

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for anyone who has already visited Lookout Mountain, Tennessee or may visit it—and this includes multitudes.

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## Four-Day Woodsmen

(From page 23)

But whether a boy makes a four-hour trip to the forest from his home in Idaho or a four-day trip across the continent, he heads over the same compass course. Right from the start the youngsters are taught that out in the woods their compass is their best friend. That perhaps is one of the main reasons for the success of the Idaho program—that and the use of planes in guiding ground parties.

Map and compass work isn't theoretical, either. Day before school starts white or yellow flags pop up on distant ridges—with a few confusing ridges in between. With nothing but their compasses to guide them the boys start off—in pairs—to run the flag courses. Here's one place where the chances for cheating are slim. Either there is an instructor at each flag or there's some piece of evidence each boy must know about to prove he was there.

Tacking a playing card to the tree at each flag station has been a common practice. First station might be the ace of diamonds, the next the deuce of clubs, the next the jack of spades, and so on. As each pair comes in their card list is checked.

Ground work comes first but the training schedule quickly takes to the air. Main objective here is to drive home to every ground worker a realization that successful air operations in forest defense depend upon complete and intelligent cooperation of everyone below.

"We could have the best air organization in the country, but if men on the ground just stand around and gawk when a plane flies over it is all so much wasted effort. Men who do that might as well be trees."

Source of that potent piece of modern philosophy pegging the role of the plane in modern forest protection was Glenn "Slim" Walker, deputy warden of the Potlatch half of the association. Walker, a crack pilot himself, knows from experience how important the ground half of the team can be.

Walker once made six passes at a lookout tower, trying to buzz the occupant out into the open. He had a message to drop. Slim dropped as low as he dared, even yelled at the top of his voice. Still the lookout stayed inside. Finally, in disgust and about out of gas, Walker flew back to base and phoned the tower.

"Unless a man sees the message fall and follows the streamer he isn't likely to find it," Walker declared.

# ANNOUNCEMENT

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From that time on, ground co-operation with planes has been on the smokechaser school schedule. Men are taught how to signal a plane, how to receive signals, and above all to take more than a gawking interest in any plane flying over. They are instructed, and with emphasis, to remember any plane in distress and to note, down to the second, the time and the direction of its flight.

What Curtis and his co-workers are looking for are more youngsters who will think fast, the way Gene Hansen did a few years ago. This high school boy went straight from smokechaser school to a lookout.

Curtis was flying over Gene's territory early one morning when he spotted a sleeper fire. A snag had been hit by lightning a day or so before. Sleeper fires are easily spotted from the air—about daylight, that is.

"You can almost see the smudge from a cigarette then," Curtis declares.

That particular morning, Curtis was up in a Cub plane which did not have a radio. But he did have his radio loudspeaker—his "Big Voice." With this speaker he can boom his voice into any tower, across canyons. Leaning out of the plane he pointed it pistol-like at Gene's tower.

"Gene," he said, "You've got a sleeper fire. Get the message to headquarters." Gene signaled his understanding.

Slowly and clearly, Curtis gave him instructions as the plane circled the tower. He gave the lad the location of the smudge, the closest route to it.

Back on the ground a short time later Curtis learned how Gene had handled the emergency. Instead of taking down the message, Gene had merely lifted the receiver off the phone and rung headquarters. Curtis' voice boomed into the tower, into the phone and over 30 miles of phone line.

The dispatcher at headquarters caught the spirit of the plan and turned his phone directly into the two-way radio microphone. Thus Curtis' voice came down through about 500 feet of air, over 30 miles of phone line, back through 30 miles of air to a patrol car which wasn't more than a mile and a half from the circling plane.

Then there was the alertness of another lad at a lookout. He remembered one lesson: If you ever get up during the night take a good look over your territory.

At 2:30 one morning he did just that and spotted a new fire. Crews were on it in minutes. They found it had been set. A few hours later a pair of surprised arsonists were caught. Early morning wasn't as safe a time to set a fire as they figured it would be.

Final exam at the school is a series of real fires. The boys go to them, put them out, and return to base. For this they get the real thing in packs and fire tools.

Might as well learn now," Slim told the boys with a chuckle as he passed out the packs, "there aren't goodies in the packs any more."

Used to be each pack contained a chocolate bar or some other quick-energy food. No longer. Seems there was too great a temptation for the boys to tear into their packs just out of camp to get the candy bars. Never able to put them back as expertly as they had been assembled in the first place, they had uncomfortable loads the rest of the trip.

On some of the "exam" fires the boys are walked in by instructions from a plane. Airplane direction of ground crews by the "Big Voice" has been developed to a high degree in these Idaho woods.

"It's just like leading a blind man," Curtis declares. He has walked greenhorns over intricate mountain trails right up to fires they couldn't see. He circles over them and, just as he gave the directions to the lookout, tells them which way to go.

Boys at the Idaho school learned, much to their surprise, that forest fire fighting is one place where there is no penalty for turning in false alarms. There may be some kidding, but no serious reprimand. Fact is, Curtis himself once sent a crew out to put out a smoke which turned out to be the engine of a train loading sheep.

Clouds of dust from bands of livestock on the move, patches of yellowing ferns have been reported by eager lookouts. One even reported the moon.

Here's how Dwain Space, veteran of 20 years with the protective associations, summed up the attitude toward reporting these false fires:

"We'd rather go out on a dozen false alarms than let one fire get out of hand just because you waited to be sure it was the real thing you saw and not a false smoke."

There's just one assignment in the four-day school where the boys need no help whatever. Given their lunch bags for an all-day jaunt they know exactly what to do with them.



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## Alabama Council

(From page 19)

some delicate, controversial issues. It is an established, recognized, permanent institution.

Creation of the Council was not premeditated. It had its almost accidental beginning in March 1939 when Alabama Polytechnic Institute called together a group of public forestry workers to discuss ways and means of coordinating the activities of public agencies. The Agricultural Extension Service and Experiment Station of Alabama Polytechnic Institute, the U.S. Forest Service, the Soil Conservation Service, the State Division of Forestry, and the Tennessee Valley Authority sent representatives.

While the record is not too clear, two problems appear to have prompted the call: 1) Relationships between an established state agency and a new federal agency; 2) Dissatisfaction with the acute, long-standing forest fire situation throughout the state.

The agency representatives made a real effort to perform like statesmen rather than as narrow agency proponents. They came to substantial agreement on statewide needs and forest development opportunities. Each agency accepted the functional status of the others and tried to find situations and methods where all could promote a common program. Forest fire control and farm forestry finally emerged as major problems worthy of a coordinated effort.

The next meeting of a somewhat similar group occurred in July 1939 as a subcommittee of the State Land Use Planning Committee. Its purpose: to draw up a state farm forestry program as suggested by the Norris-Doxey Cooperative Farm Forestry Act of 1937.

Meantime, a major development in Alabama forestry had occurred: The late Brooks Toler, a young, forceful professional had been appointed State Forester. His influence was felt immediately. He was interested in a broad state forestry program. Apparently at his instigation, a September 1939 conference of the "Sub-Committee on Forestry of the State Land Use Planning Committee" decided that it should henceforth constitute a State Forestry Council. The first meeting of the group under its new name convened in June 1940.

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At this meeting and another one in September of the same year, the Council, as such, became a working organization. Then, for possibly the first time, there were some ideas of internal origin. But most items of concern were still being suggested by others.

Up to this point, only representatives of public agencies were members of the Council. And with a few exceptions, they held subordinate rather than policy-making or policy-influencing positions in their organization. Generally speaking, they were still trying to catch up with what was already going on in Alabama, informing each other about relatively unimportant matters.

By February 1941 the Council had gained confidence in itself and some momentum. Eleven guests, three of them representatives of private industry, were invited to this meeting. Increased and broadened representation to include private industry was unanimously adopted.

The following groups were requested to nominate two regular Council members: U.S. Forest Service; Soil Conservation Service; State Division of Forestry; Agricultural Extension Service, Agricultural Ex-

periment Station, Alabama Polytechnic Institute teaching staff; Tennessee Valley Authority; industry—a total of 16 from public agencies and two from private industries. Impressed by the potentiality of such an organization, each group accepted invitation to membership and designated permanent representatives. In each instance one was a policy maker in his own organization.

Two meetings were held in July 1942, and the important principle of industry-public agency balance took form. However, the Council lost stimulus through wartime personnel changes. State Forester Toler left Alabama to join the Southern Pine Association. For over a year, the Council was dormant.

In November 1943 a small group re-examined the idea and attempted to revive the Council along more formal lines. J. M. Stauffer, the new State Forester, called a reorganization meeting in January 1944. Out of that meeting came the guiding principles which have determined Council operation. These are the important ones:

1) The Council would provide a forum for the discussion of statewide problems—technical, administrative, (Turn to page 39)

## Forum

(From page 2)

do not. As Mr. Wray shows, men unacquainted with wilderness procedures and areas need guides — human in some instances, aerial photographs in others. In a course I teach in wilderness camping we discuss early in the term, the usefulness of guides to overcome the fears of beginning woodsmen and to insure their safety. I object not to the use of other men's help— aerial maps in this instance—but to the title *Be Your Own Guide*, while using the aid of others.

A statement by Harold Titus made years ago illustrates how a man can use the skill of others while honoring himself as good enough to go along:

"I'm not so proud of this trophy. . . . The guide directed the stalking, picked out the ram he thought I should try for, and told me when . . . and so I'll never swell up, I hope, when I lead guests in after dinner to look at this particular head."


Then Mr. Wray writes concerning me: "He insists that the way to get the most out of forest recreation is to pit your skill against Nature, with no artificial aids." I do not insist. I remind whoever reads my comments that outdoorsmen can advance beyond "trial and error methods" to considerable skill in reading the country. Observation does convince me that one of the finest things for a man to be, beyond a good husband, father, and citizen, is an outstanding outdoorsman. And in these troubled times, which extend war into many wildernesses of the world, skilled

outdoorsmen often are among our most useful citizens. So it is to be hoped that many who go to the forest for fun, resolve to become expert woodsmen.

I am sorry that Mr. Wray introduced the statement: "Man . . . goes into the woods to enjoy himself, not to show off." Few men have been more admirable than the great outdoorsmen of the world, and their number includes few whose greatest urge is vain display. One does not find audiences in the wilderness, and those whose deeds are great seldom are more articulate than those with less to recite.

Just to prove that this feud has not been all blood and tears we include a P.S. which was directed to Mr. Wray:

Carl Newport told me today that you hope to write within the popular and semi-popular fields. Splendid! Since I rather much specialize in forest recreation, I shall be glad to help edit anything you write over in territory I have been exploring. Your article, *Be Your Own Guide*, was well written and very interesting, besides being very useful. It just happened that you missed some little significances that several of us, professionally involved in forest recreation, have been working upon in an effort to have forest recreationists desire and develop great skill, expect rich recreational rewards, and help protect areas in which advanced experiences may be lived.



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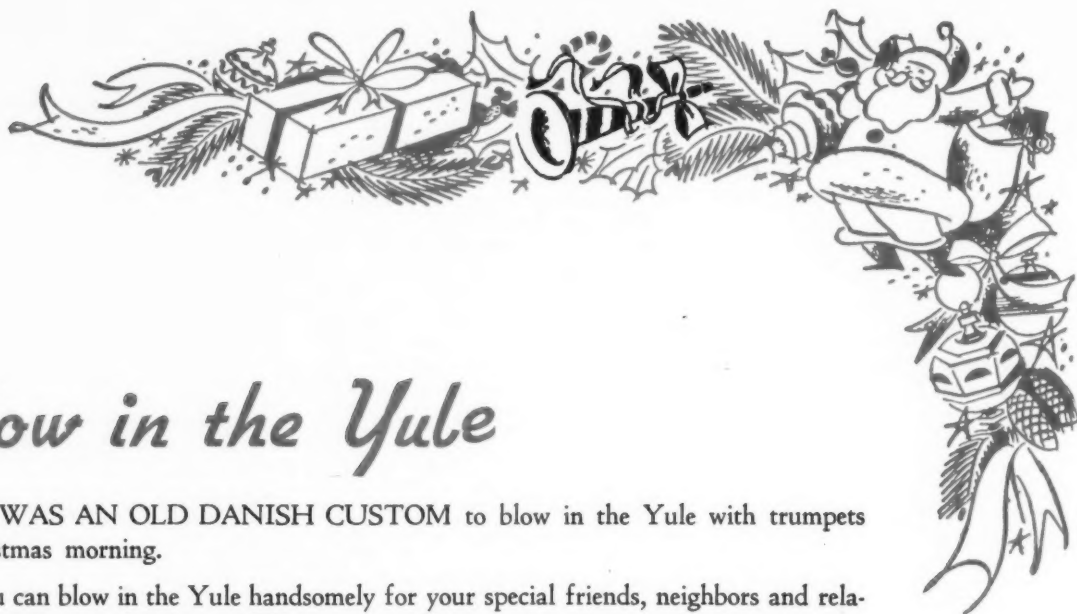


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- 3 A specially designed Christmas card announcing your gift with *your name* on it as donor, to arrive Christmas week.

Think of the people who are interested in trees, wildlife, in the natural resources of our country, then jot their names down on the coupon below (use another sheet for additional names), tear it off and mail it to us immediately. We will see that they are entered as members of The American Forestry Association.

----- PLEASE FILL IN, TEAR OFF, AND MAIL. -----

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## Alabama Council

(From page 37)

and relationship. It would provide for critical review of all programs and policies affecting or likely to affect forestry in Alabama.

2) It would not be a pressure group, and would pass few resolutions. The balance between private industry and public agency representation would be maintained; neither group would be dominant.

3) Members must attend in person or by personal proxy or be dropped. (Later, after one guest representing a public agency attempted to monopolize a meeting, the further principle was added that guests could attend only with permission of the Chairman.)

4) The Council would strive to eliminate duplication or cross purposes in forestry programs.

5) There would be only two regular meetings a year. Dues would be adequate for stationery and postage but there would be no paid officers.

6) Officers—elected for one year—consisted of a chairman and a secretary-treasurer.

7) Formal action on every resolution must be unanimous. (Despite some experiences elsewhere, this is a workable doctrine.)

For the past eight years these have been the basic operation rules. Meetings have been held regularly in January and July. Attendance has been almost 100 percent although three members have been dropped for non-attendance.

The range of interests is indicated by the following list of subjects discussed over the years:

Use of prisoners of war in timber production; forestry handbook for non-professional workers; federal income tax laws and sustained-yield forest management; desirability of state severance tax to finance fire control; probable timber situation at end of the war; forestry and agriculture as competitive land uses; rules of forest harvesting; School of Forestry at Alabama Polytechnic Institute; forestry research in Alabama; American Forest Products Industries—More Trees for Alabama.

Also, licensing of foresters and timber cruisers; tree farms; county forestry councils; pulp and lumber mill competition for raw material; meeting the demand for forest tree seedlings; financing of state forestry



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programs; littleleaf and Cronartium diseases; interest of bankers in forest credits and forest management; research on naval stores and breeding of better species of pine; "Keep Alabama Green" project.

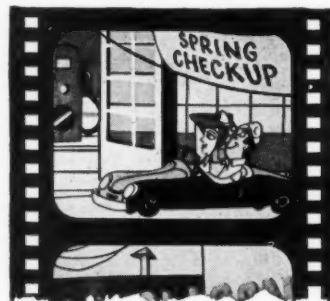
These have been the important forestry questions in Alabama. Evaluation of their relative significance is difficult. Each was important at the time of discussion; each is pertinent to forest development in the state. The School of Forestry, Alabama Polytechnic Institute, was established and is now functioning. A severance tax was adopted and it now produces a revenue of about \$400,000 a year for forest fire protection. "More Trees for Alabama"—the first such industry project conducted in the United States—was, at the specific request of American Forest Products Industries, sponsored by the Council and operated initially as a Council project.

The forestry handbook, first adopted as a Council undertaking in 1942, has not yet been completed. Licensing, although apparently favored by a strong majority, was tabled after several discussions because one member announced that he would vote against it—the only veto threat in eight years.

Activities and meetings get little publicity. This is deliberate. Meetings and contacts before meetings are more in the nature of counseling or consulting sessions. Group opinion, judgement, and consensus tend to crystallize. Actually, the influence of the Council is subtle and indirect. It is brought to bear principally by member action, through the influence they exert as individuals and through the organized interests they represent. Thus, the Council's effectiveness is increased many times.

Evaluation of influence and effectiveness is difficult of evidential analysis. Most important, perhaps, is the confident feeling of members themselves that the Council is influential and effective. There has never been any indication of frustration.

Experience of the Council supports the premise that the first step in the intricate coordination process is to provide reliable information and responsible communication. Until these are secured within a state in the field of forestry, desirable integration of objectives and activities among public agencies and between public and private interests will escape us.



## At your age!

If you are over 21 (or under 101) it's none too soon for you to follow the example of our hero, Ed Parmalee (above) and face the life-saving facts about cancer, as presented in our new film "Man Alive!"

You and Ed will learn that cancer, like serious engine trouble, usually gives you a warning and can usually be cured if treated early.

For information on where you can see this film, call us or write to "Cancer" in care of your local Post Office.

American Cancer Society

## Bequests to THE AMERICAN FORESTRY ASSOCIATION

There are many members and friends of the Association who find it impractical to contribute to its educational activities during their lifetime. Gifts in the form of a bequest are welcomed. Officers of the Association will gladly consult at any time with those who wish to know more about designating gifts for educational work in forest conservation.

Following is a paragraph suitable for incorporation in wills:

"I hereby give, devise and bequeath \_\_\_\_\_ to The American Forestry Association, Washington, D. C., a non-profit District of Columbia corporation, or its successor, or successors, for the purpose of promoting the corporate activities of said Association."

## Harvard Filing

(From page 25)

tion shown on the map, and when he returns to headquarters at the brick building and dormitory which houses the Harvard Forest staff, he will type up his report and code it "C 1950." Perhaps he thinned an area; perhaps he marked certain trees for cutting. Whatever, he notes his work in the report and places both the map and his report in the compartment file.

What could be simpler?

Foresters are continually searching for simple and efficient record systems. Harvard's former system, which Dr. Raup considers hopelessly outclassed by the present one, confronted foresters with delays, time-consuming research, and, in the long run, incomplete studies of their work. To start the new filing method, of course, all previous files had to be consolidated in the new system.

But when you're short staffed and have as much interesting and important work under way as the Harvard Forest, the days and weeks saved in the filing cabinets pay dividends in the forests.

## Your Shade Trees

(From page 26)

and roots may weigh a ton or more. The entire weight of this tree is pressed against the small area covered by the rope or cable lifting the tree.

The plant tissues or cells are often badly crushed by the rope when the power is applied to lift the entire tree and ball of earth. Such injury does not show up until the tree has been planted for several months and new growth becomes apparent.

Sometimes the strain on the rope causes the bark to slip and thus injure the cambium cells beneath. When this occurs, the bark dries out and if the injury has been completely around the trunk, the tree will gradually succumb.

After trees are moved, it is rather common to find them girdled, or partially girdled, by guy wires wrapped around the trunk of the tree and left until they have cut deeply into the bark. Such injury, of course, interferes with the growth of the tree at that point.

Sometimes cables are wound around a tree to support telephone

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poles, derricks, etc. In such cases the injury is due to the crushing of the tissues underneath the outer bark even though the trunk is protected to some extent with burlap or pieces of boards. Drilling a hole through the trunk of the tree and inserting an eye-bolt is the proper method of anchoring such reinforcing cable.

Scraping the outer bark to eliminate hiding places for insects is dangerous because too much bark may easily be removed with consequent sunscorch or frost cracks in the bark. Furthermore, the benefits derived from scraping the bark are usually very minor.

When "Sonny" gets a new hatchet he may feel like Paul Bunyan, Junior, and take a few whacks at the prized tree on the home grounds. If this results only in hachure markings on the bark, they may do little harm and may be left for a year for observation. By the end of a year, if there is no progress in growth over the individual ax cuts, it will then be necessary to bark-trace and dress the area for proper healing.

## Your Woodland

(From page 17)

have to be just right. If the trees are too thick they will not produce enough side branches to give the desired bushiness. If they are growing too rapidly the distance between whorls will be excessive. Consequently, the best Christmas trees grow in rather open stands on poor sites.

This is just the opposite of conditions needed to grow trees for timber; therefore conflicts between the two seldom occur. However, good potential timber stands should not be mismanaged by indiscriminate or excessive Christmas tree cutting. When properly done, the removal of Christmas trees can serve as an early thinning, which should benefit the crop trees retained for timber.

Small owners and big operators alike have found that it pays to aid nature when she does not produce just the ideal conditions for growing Christmas trees. This is done by what is called "cultural practices." They may consist of pruning the lower branches to slow the growth weed tree species, thinning, scarring and induce bushiness, removing the bark to retard leader growth, and other little tricks of the trade.



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Fragrant evergreen boughs of pine, fir, and cedar; mistletoe from the Oregon white oak; and fresh, clean cones of lodgepole, ponderosa, and sugar pine are also gathered from the forest for holiday decorations. These are fashioned into door charms, wreaths, sprays, and evergreen rope to be sold at attractive prices on the Christmas market.

Unlike holiday decorations and Christmas trees, the harvesting of florist's greens continues practically the year around. Many fern and brush pickers, as they are called, make it their full-time job. Some pick only during weekends and slack periods, but when they do work they generally earn good pay—sometimes as high as \$20 a day or more.

Many farmers and small owners have marketable sword fern, evergreen huckleberry, and salal in their woodlots, but fail to realize its value. Occasionally, they may know of its worth but don't want to bother with picking it, for there is a skill in fern and brush picking that takes some practice to acquire. Many forest owners prefer to lease picking rights or to sell their greens on a stumpage basis.

To meet market specifications, sword fern should be picked with a frond length of 24 to 26 inches. Tips must be unblemished and straight. Fronds with excessive spore layers or discolorations are not acceptable. As the ferns are picked they are counted and tied in bunches. A bunch consists of 52 fronds, weighs about one pound, and brings from 10 to 18 cents, depending on season and supply.

Specifications for huckleberry and salal brush are slightly different. Sprays must be clean, flat, dark green, and from 30 to 32 inches long. The brush is packed from the woods in bundles as big as a man can carry. Then it is hauled to a receiving station where it is sorted and weighed

into one and three-fourths pound bunches. The picker is paid from 11 to 18 cents a bunch for his brush.

Cascara bark is another minor forest product common to the Northwest. The annual output from this region is estimated at five million pounds. Dry bark sells for 12 to 25 cents a pound. Cascara trees should always be cut before peeling, leaving a low, slanting, unpeeled stump so that coppice sprouts can produce another crop. Small trees should not be peeled until they are at least four or five inches in diameter.

Much valuable bark is wasted each year because of careless or improper peeling methods. Moreover, considerable quantities of bark are obtained by trespass. Cascara, or any forest product for that matter, should not be taken from public or private lands without first obtaining the permission of the owner.

There are numerous other items such as berries, Oregon balsam, tree seed, crude drugs and novelties that can be collected from the forest and sold. Markets, however, are often limited.

Forest income from salvaging windfalls, old cedar, sound snags, and fuel-wood, or from pre-logging, thinning, and intermediate harvest cuts has not been mentioned. This topic will be covered in a later article.

When a forest owner wishes to cash in on the minor forest products growing on his lands, he might profit by first consulting his farm forester, county agent, the Extension Service, forest officials, or some other local competent authority.

Free information and advice can often be obtained just for the asking. Pacific Northwest states have issued excellent publications intended to help the small forest owner solve his management problems. Several of these bulletins deal specifically with the minor forest products.

## Changes Announced in AFA By-laws

The Board of Directors, The American Forestry Association, announced October 12 after its meeting in Asheville, North Carolina, two minor changes in the Association's articles of incorporation and by-laws.

On page two the word legislative was deleted from the seventh line of the second paragraph (dealing with objects of the Association). As

amended the clause reads, "and the advancement of educational or other measures tending to the promotion of these objects."

On page three the word legislative was deleted from line 19 of the paragraph titled ARTICLE II—Objects. As amended the clause reads, "to promote the educational and other measures tending to the accomplishment of these objects."

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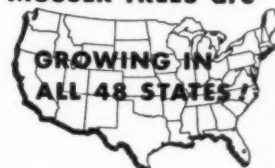
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## Washington Lookout

(From page 4)

no monetary return, may be appraised at about the same value as timber and range use."

More pointed, perhaps, was the comparison of expenditures on lands under the two administrations. "On 16,789,000 acres of national forest lands, proposed capital expenditures are estimated to be \$312,295,000 or \$18.60 an acre, and on 22,500,000 acres of land administered by the Department of the Interior," wrote Interior Secretary Oscar F. Chapman with evident feeling of unfairness, "proposed capital expenditures are estimated to be \$29,161,000 or \$1.30 an acre."

Secretary Brannan took the stand

that there is little significance to such comparisons "because the two groups of properties vary so widely."

The manner of financing installations for water users also came in for discussion. In the case of those installed by the Soil Conservation Service of the Department of Agriculture, the program indicates that nearly 30 percent of the cost would be paid by the federal government. In contrast, the Secretary of the Interior pointed out that costs of projects undertaken by the Bureau of Reclamation are borne wholly by the water users. "It is obviously wrong," he concluded, "for one federal agency to require full payment of rehabilitation and betterment costs on

irrigation developments, while another federal agency undertakes the same type of activity in the same area and provides at federal expense nearly one-third of the work."

Action on this ten-state program now awaits the 83rd Congress, a new Secretary of Agriculture, and evidence of public demand. That Secretary Brannan was sure he had strong public support was evidenced in his letter of July 3, 1952, to Speaker Rayburn—"the people living in the watersheds covered by the reports are so interested in this program that I am submitting the report to the Congress in advance of the period normally allowed for review."



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## Eisenhower, Truman Pledge Support To Citizens' Resources Conference

Announcement of a citizens' conference on the conservation and development of natural resources to be held in Washington in cooperation with the White House next March—the first of similar scope since President Theodore Roosevelt held the White House conference of governors to consider the overall resource picture—has been announced by Horace M. Albright, president of Resources for the Future, Inc., a new non-profit corporation established to support education and research in this field.

President-elect Dwight D. Eisenhower has declared his intention to join in the call for the citizens' conference, and President Harry S. Truman has offered his cooperation and that of the Government in the interval before the new administration takes office.

"It is high time," Mr. Eisenhower stated, "that the conservation conference of 1908 should be reborn in a mid-century setting. I shall be glad to issue or join in an appropriate call of a conference to consider the subject of resources for the future, and to ask the cooperation of governmental and private agencies in the preparations for and conduct of the conference meetings."

In pledging White House support in preparing for the conference, Mr. Truman stated, "Your organization will indeed be rendering a public service in the finest tradition by providing a forum for the discussion of issues in the resources field. . . ."

The non-profit corporation which will organize and conduct the conference, Mr. Albright said, will undertake "long-range programs of research and education to assure the resources essential to the progress, vigor, and security of the Nation."

Mr. Albright pointed to the recent report of the Paley Materials Commission, and to the earlier report of the Water Policy Commission, and related studies by the Hoover Commission, as illuminating the materials and resource problems and giving timeliness to steps by private citizen groups to meet it.

"The report on materials policy," Mr. Albright said, "points out that, with less than 10 percent of the free world's population and 8 percent of its land area, the United States consumes half the free world volume of materials; that we have completed

the transition from a raw materials surplus nation to a raw materials deficit nation and from a net exporter to a net importer of many of our vital materials. We have been "mining out" our renewable resources—soil, forests, and underground water—and restoration, where possible at all, is slow and costly."

The non-profit corporation, Resources for the Future, Inc., was established by a committee of citizens which accepted an invitation from The Ford Foundation to serve as an advisory group on resources, and to assist the officers of the Foundation in planning a program and to work in the field of research and education for resources development and conservation.

In addition to Mr. Albright, who is President of the United States Potash Company, Inc., and former Director of the National Park Service, members of the Board of Directors are: Edward J. Condon, Vice President of Sears, Roebuck and Co., President of Sears-Roebuck Foundation and former President, Friends of the Land; Dr. Reuben G. Gustavson, Chancellor of the University of Nebraska and former member of Board of Governors of the Argonne National Laboratory for Atomic Energy; E. B. MacNaughton, formerly President of Reed College and of First National Bank of Portland, Ore.; Leslie A. Miller, former Governor of Wyoming and Chairman of Resources Task Force of the Hoover Commission; Fairfield Osborn, President of the Conservation Foundation; William S. Paley, Chairman of the Columbia Broadcasting System and Chairman of the President's Materials Policy Commission; Beardsley Ruml, Consultant and former Advisor of National Resources Planning Board; Stanley Rittenberg, Director of Education and Research, Congress of Industrial Organizations; M. L. Wilson, Director of United States Extension Service, Department of Agriculture; Charles W. Eliot, Planning Consultant and former Director of the National Resources Planning Board.

Officers of Resources for the Future, Inc., are: Mr. Albright, President; Mr. Eliot, Executive Director, and Elmer A. Hennig, Secretary-Treasurer. Offices of the new organization will be at the Cafritz Building, 1625 Eye Street, Washington, D. C.



## Chamber President Urges Suspension of Federal Land Acquisition Pending Restudy of Whole Problem

Suspension of all federal land acquisition pending re-examination of federal land policies was proposed by Laurence F. Lee, president of the Chamber of Commerce of the United States and a prominent insurance executive at the annual meeting of the National Lumber Manufacturers' Association in Washington on November 13th.

In an address in which Mr. Lee said the United States is becoming second to Russia in the extent of its government land holdings, he proposed that the NLMA call together such groups as the pulp and paper industry, several state cattle and sheep growers organizations, the Council of State Governors, the taxpayers' associations, the National Education Association and the local and state chambers of commerce to work out a four-point program of proposed corrective legislation as follows:

(1) Registration of all federal lands with the Department of the Interior. The record should disclose the annual rate of increase or decrease of federal land holdings and so end the "confusion as to the extent of government-owned lands."

(2) Organization by Congress of joint boards representing federal, state and private-land ownership to provide more accurate data on federal lands and to establish criteria on which to base the type of ownership.

(3) Examination of federal land

holdings by Congress to determine what property is best suited for private ownership.

(4) Suspension of all federal land acquisition except that needed by the military during the period of registration and examination.

Mr. Lee said, "We do not advocate that all land held by the federal government should be turned back to private ownership. National parks, for example, and the research areas, forested lands necessary for watershed protection, certain military reservations and similar areas probably are best adapted to federal ownership. Acquisition, retention or disposal—in every case—should depend on what is best for the public interest."

In urging that Congress be asked to make an examination of federal lands, Mr. Lee said there should be no delay in determining "what property is best suited for private ownership to the end that it be offered for sale to the public, under proper safeguards, as soon as possible and thus be placed on tax rolls and in productive use by private enterprise."

## Record Park Travel

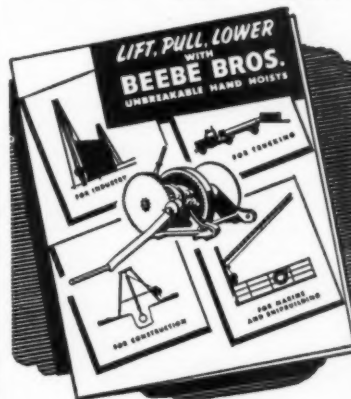
Acting Secretary of the Interior Vernon D. Northrup announced recently that visitors to the national parks and other areas administered by the National Park Service totaled 41,516,664 in the 1952 travel year, a record in annual travel to these areas.

Park Service Director Conrad L. Wirth, in reporting the figures, pointed out that the 1952 total was almost double that for 1941, the last prewar year, and for 1946, the first travel year after the war.

Most heavily visited area in the 1952 travel year was the Blue Ridge Parkway linking Shenandoah National Park in Virginia and Great Smoky Mountains National Park in North Carolina-Tennessee. A total of 3,374,962 persons visited this area, nearly a million more than last year.



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# Editorial

## THE REPUBLICAN HERITAGE

With the first Republican administration in 20 years destined to take office in Washington next month, it might be timely to point out that some of the great measures in our conservation history had their origin in the Republican Party and indeed much of the present national policy as it applies to national forest land was laid down under GOP regimes.

For example, in recent years Democrats have not always disclaimed the credit for being the originators of the traditional "The Greatest Good to the Greatest Number for the Longest Time" as it pertain to management and custodianship of the national forests. Actually, this theme was first used in the administration of Theodore Roosevelt, a Republican, and given wide publicity by Gifford Pinchot, another Republican.

Prior to the administrations of "Teddy" Roosevelt, the Forest Reserves (which later became the national forests in the West) were set up by act of Congress in the administration of Republican Benjamin Harrison. In 1905, under President Theodore Roosevelt, and following an American Forest Congress called by The American Forestry Association, the U. S. Forest Service was established to manage what now became the national forests in the West. Subsequent legislation enacted under Republican leadership, including the Weeks Law, the Clarke-McNary and Forest Pest

Control Acts—saw the development of the national forest concept in the East and further crystalization of policy as regards their management and care.

This is a proud heritage of looking after the interests of all the people of the nation. The new administration will have much to live up to which is why there should be further clarification of forest and public lands planks in the party platform that are far from clear when regarded in the light of past achievement. One of the greatest challenges facing the new administration will be that of bringing all segments of the forestry movement—federal, state and private—together in a new spirit of trust and mutual confidence. But if working "partnership" is to be achieved, there must be clarity of purpose and well-defined policy based on historical precedent. This will tend to eliminate old doubts and fears that have plagued the efforts of sincere and able men to get on with the job—fears that have even made it difficult to get basic agreement on how to collect facts on forests and forestry that we all need. It would also tend to prevent an epidemic of new fears. For poorly-defined policy will immediately be construed as an invitation to liquidate large segments of federal lands as they now exist. In fact, the lines are now being drawn (see page 47). Which points anew to the need for clearly-defined policy in forestry as a new era in the nation's history begins.

## FIRE LANES IN THE MIND

Clouds of smoke eight thousand feet thick that billowed out of the South and Southwest to engulf eastern seaboard cities in November gave substance to a U. S. Forest Service warning that the nation, especially states east of the Mississippi River, faced the most critical forest fire hazard in recent years. By mid-November soaking rains had helped to improve an explosive situation but not until upwards of one million acres of growing timber had been destroyed.

AS AMERICAN FORESTS went to press reports were incomplete from hardest-hit areas but there were indications that losses in Tennessee might top 300,000 acres while the burn in Arkansas may exceed the 100,000 acre mark. Other drought-belt states reporting severe losses were Louisiana, Mississippi, Oklahoma and Texas. Illinois and West Virginia also were hard hit.

On the credit side, a number of states includ-

ing New York, New Jersey, Pennsylvania and Virginia promptly closed their forestland to the public. Hunting seasons were postponed. Radio, television and the press did a creditable job in keeping the public informed regarding the gravity of the situation. And increased fire fighting equipment and trained personnel probably held losses to a fraction of what they would have been in years gone by.

But those are the few bright spots in an overall bleak picture when one considers that a majority of last month's fires were man-caused—some incendiary—in a period that called for the utmost caution. No amount of organization and equipment to combat fires after they start will ever effectively curb those fires until carelessness itself is curbed. Which points to the fact that the place to build a truly effective fire lane is in the minds of men, women and children.

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# Forests for the Future

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# **FORESTS FOR THE FUTURE**

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**A Study of Figures, Trends and Viewpoints**

By

**THE CONSERVATION FOUNDATION**

30 East 40th Street, New York City

1952



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This presentation of figures, trends and viewpoints pertinent to the nation's forests is printed this month as a supplement to AMERICAN FORESTS and is a special reader dividend. Prepared by The Conservation Foundation, it does not necessarily reflect the views of The American Forestry Association.





## FOREWORD

THIS study seeks to summarize varying interpretations of significant facts and figures relating to our forest resources. Its purpose is to increase popular understanding of the problems confronting the makers of policy at this stage of progress in American forestry.

In order to estimate the present forest situation and formulate policies for the future, it is necessary to recognize wide divergence in conclusions which reasonably flow from the commonly accepted facts. For example, accepting as a fact that in 1945 three trees of sawtimber size were being cut or destroyed by fire or natural causes for every two that grew, an extremist might argue that a continuance of this ratio for another 60 years would accomplish destruction of our sawtimber supply.

Yet another might argue that the continuance of the present trend of increasing growth for another ten years will bring growth and drain of sawtimber into balance. We believe that a presentation of the accepted facts, with summaries based on a study of the views expressed by different groups will be of value at this time. Our own conclusions are added in the hope that they may have value too.

The most generally accepted facts and figures are first set forth and terms defined. Next, our summaries based on study of the respective views of the U. S. Forest Service, and of groups affiliated with the wood manufacturing and processing industry, and of Dr. Luther Gulick in his recent study "American Forest Policy" are presented. These summaries deal with "Drain, Growth and Supply," "The Problem of Small Holdings" and "The Problem of Regulation of Private Practices."

The selection of these issues tends to overemphasize the points at which difference of opinion occurs. Actually, major divergence is limited to only two issues: the rate at which our forests are still de-

teriorating; and the wisdom of various proposals for further government regulation now to check depletion and increase productivity. It is therefore of paramount importance to consider them only

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*From the earliest days of civilization wood has been essential to man. Five thousand years ago it was so, and now today it is still so—even in this mechanized age. It will always be so, one can believe. But the forests do more than produce the wood that is essential to our economy. They are the mother of water, water for our grazing lands, for fertile fields, for industry. Forests have their spiritual value in terms of beauty and recreation—but that is something else again.*

*This report reviews significant aspects of the forest situation in our country. It is a delusion to think we have as yet really solved the problem of our forests for the future. However, widespread and growing attention is now being given to the subject. Consequently there is good reason to anticipate that with the increasing cooperation between forest owners, industry, federal and state governments, our nation's objectives for the protection as well as the development of our forests can be attained.*

*Fairfield Osborn,  
President,  
THE CONSERVATION  
FOUNDATION*

---

against the background of the very wide areas of agreement that exist between the views of the Forest Service and those of forest industry. These areas embrace most of the major factors that underlie the forest situation. They include the following considerations:

1. The productive capacity of our commercial forest land is capable of meeting the nation's needs for forest products in the foreseeable future provided the growth potential is developed as required. If necessary, current growth rates could be at least doubled.

2. Protection from fire, insects and disease is a fundamental requisite.

3. There is need to reforest denuded and understocked lands capable of profitable production.

4. Destructive cutting practices must be eliminated.

5. Increasing adoption of good management practices on all classes of ownership is vital to large-scale advance in the status of our forests. The bulk of such improvement must occur on the small holdings and will require continuing educational aids.

6. Coordinated research in both wood growing and utilization is a basic essential to progress.

This large measure of accord finds concrete expression through the Cooperative Programs in which federal, state and private interests have joined. Outstanding among these are the programs that deal, respectively, with prevention and control of fire; with suppression of forest insects and disease; with planting and restocking; and with the provision of on-the-ground assistance to small owners in growing, harvesting and marketing their timber.

Also, closer coordination is being developed between the research activities of public agencies and private organizations. Many of the research projects undertaken by the Forest Service rest on cooperative agreements that involve the active partnership of state agencies, private industry or private institutions.

It is such cooperation, covering virtually all phases of the business of growing and utilizing wood, that has been responsible in large measure for the rapid advances made in recent years on an exceedingly broad front. Its continuation into the future, gradually amplified to include the bulk of small owners, is vital to attainment of a balanced and increasingly productive forest economy.

In presenting our summary of what we call the "Industry View," we would make clear that this is our own synthesis of many statements by various groups and individuals. Obviously, industry has many voices. Some statements included in the "Industry View" are taken from printed reports, some from letters and others paraphrased from oral statements. Much of the material has several sources. We believe that most of those whose material is used or paraphrased have seen the script and consented to this use. But no one of them is responsible for our assembly of what we believe to be a reasonable summary of the industry's viewpoints.

So, also, we are grateful to Dr. Gulick and members of his staff for reading and permitting our summary of his views set forth more fully in "American Forest Policy."

To Lyle Watts, Chief of the Forest Service, when this study was commenced; to his successor, as Chief, Richard E. McArdle; to Edward C. Crafts, H. R. Josephson and others in the Service, we express our

thanks for their patience and help. They, too, are not responsible for our interpretations. The "Reappraisal" and other Forest Service publications speak for themselves.

Generous criticism and help have also been given by many others including particularly Tom Gill of the Charles Lathrop Pack Forestry Foundation, Clyde Martin, Samuel Dana, Henry Clepper, S. L. Frost, Charles Gillett, J. C. McClellan, W. D. Hagenstein, E. W. Tinker, L. T. Stevenson and Nort Baser.

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Washington, D. C.



## FACTS AND FIGURES SUBJECT TO INTERPRETATION

### Background

The first official estimate of the nation's forest resources was made in 1909. At best, its findings represent only an informed guess. Since that date, however, inventory methods and techniques have been constantly improved. In 1928 Congress authorized the establishment of the Forest Survey. Operated and administered by the Forest Service through its regional experiment stations, it consists of two separate and distinct parts: 1) "initial surveys" of areas being covered for the first time; and 2) "re-surveys."

The initial survey as a whole is scheduled for completion in the late 1950's. Re-surveys, however, will continue to return to the same area at periodic intervals of approximately 10 years, since the forest situation is fluid and subject to constant change. The total forest area to be surveyed is 622 million acres. As of June, 1951, some 428 million had been initially covered, and 121 million re-surveyed—leaving a balance of 194 million to be inventoried, located largely in the Rocky Mountain and Southwestern regions.

As originally conceived, the Survey applied mainly to national and regional problems. Gradually, it became apparent that the Survey must have state and local utility as well; requests for forest information on a local basis have increased steadily in response to a growing scarcity of desirable stumpage and to the strong demand for timber products.

The Forest Survey is not duplicated by state or other federal activities. Many states, however, contribute funds or manpower. Since 1944, 20% of the Survey costs have been met by contributions from states, counties, educational institutions, conservation organizations, private industry and land owners. These contributions have been made for the purpose of accelerating and intensifying the work.

The Survey is more than a source of timber statistics. It provides a highly detailed analysis of factual forest data, in the light of general economic conditions. Resulting information is made publicly available through analytical reports, statistical releases, maps, and by personal consultation. Some 2000 special requests for information are received annually by the Forest Service from forest industry, railroads, universities, research groups and from miscellaneous industrial and financial interests. In addition to the Congress, many federal and state agencies rely on the Survey for forest data requisite to policy decisions.

Three quarters of the Survey job in terms of dollars and manpower consists of the inventory or timber-cruising phase. The balance is composed of the determination of drain, ownership, compilation and analysis.

The present system of inventory is based on interpretation of aerial photographs supplemented by cruising of selected ground plots. The steps in a typical procedure are as follows:

1.) Acreage of forest land in a given county is estimated by the use of a grid placed on every third

print, along flight lines. The estimate is later revised after field checks.

2.) Every fifth plot of forest land is then classified into forest type, stand class and density class by stereoscopic analysis.

3.) Forest analysts next make a detailed tally of a proportion of the plots in each stand class, to obtain volume, growth, cull and mortality data and also to check the accuracy of the photo classifications. A sample of idle and agricultural plots is also checked.

4.) Estimates of growth are made, based on increment borings and stand data.

5.) Estimates of the amount of wood produced as primary forest products are obtained from sawmills, pulp mills and wood-using associations. The volume of fuel wood and fence-post production is estimated. And utilization studies are made to adjust reported production to drain in terms of inventory volumes.

6.) Final estimates are then compiled, based on statistical summaries, with analyses and recommendations.

No agency or organization other than the Forest Service is in a position to gather and compile the statistics that reflect the status of our wood resources on a comprehensive, nationwide basis. The Forest Service is thus the only source of such information.

In recognition of the need to bring up to date the findings of the 1945 Reappraisal and to supply initial data on many factors not hitherto investigated by previous inventories, the Forest Service has recently undertaken a new survey to be completed in 1954—the Timber Resource Review. Advice in planning the project has been sought from state and private agencies and from the wood-using industry. Their aid will also be sought in determining the facts of the current forest situation. The findings will constitute the base from which to chart a new course for U. S. forestry.

### Some Forest Service Comments

Since 1909, there has been a progressive shift in the terms under which subsequent inventories were taken. Each successive survey has included trees of smaller diameter and poorer quality than its predecessor, largely because of changes in our standards of wood utilization. Although all of the estimates sought to determine the volume of usable wood, in effect they actually measured different things. In addition, the inventory methods, equipment and techniques involved have undergone constant improvement.

As a result, a direct, unqualified comparison of any two of these inventories results in misleading conclusions as to the rate of trend in both standing volume and growth.

Estimates prior to the 1945 figures were weaker and generally lower than current estimates in regions not reached by the Forest Survey, notably the New England, Middle Atlantic, Central and California regions. For example, more sawtimber was

reported for the North in 1945 than in 1938, due primarily to a doubling of the estimate of hardwoods in some regions. The difference reported was much greater than could have resulted from growth even if there had been no cutting, and was partly due to an increase in the estimate of commercial forest acreage. In California also, where the progress of depletion was common knowledge, better estimates in 1945 resulted in a larger figure than in 1938.

The current estimate of sawtimber growth is 3.3 billion board feet greater than the 1938 figure. Much of the difference may be due to the nature of the estimates rather than to actual change. Improved methods of calculating growth have led to increases over earlier estimates in many regions.

### Industry Comment

Forest are not static. This voids any fixed views based on forest conditions existing at any single period.

The 1945 Reappraisal was based on sampling surveys in about two thirds of the states and on rather general estimates in the rest. Subsequent field work conducted jointly by the Forest Service and state agencies in six states revealed much larger volumes of timber in four of them than the Reappraisal indicated. Frequent adjustments to new and more accurate information will continue to be essential.

Also, the criteria and yardsticks now used to determine the character of cutting and management practices are in need of revision and should take into account the influence of local economic factors.

### Gulick's Comment

Forest statisticians and publicists have drawn various conclusions from the official inventory figures. Those who want to shock the public have called attention to the sawtimber net loss for 1945, while those who are trying to head off more government controls call attention to the improvement which has taken place in the past 25 years according to the figures. The U. S. Forest Service presents neither extreme but is inclined to center attention not on the dynamic situation but on the status of 1945. This approach is quite understandable, because more forest activities are required, and Congressional support is always hard to command unless the public is worried about possible timber famine.

The estimates for future consumption used by the Forest Service are heavily loaded with a safety factor. The actual drain for 1945 and 1948 and the "growth goal" set as desirable by the Forest Service are as follows:

	Drain		Goal
	1945	1948	2020
Sawtimber (billion board feet)	53.9	59.0	72.0
All Timber (billion cubic feet)	13.7	14.5	20.0

In view of the fact that consumption has been coming down since 1907, it is certain that 1948 is an abnormal year and that even 1945 is probably a high year. Thus the "goal" on the basis of which

our future timber shortage is predicted, would seem to be somewhat extreme.

### Conservation Foundation Comment

Reasonably reliable techniques of estimating growth and volume have been recently developed, but the vast size of the inventory job still precludes any high degree of precision.

As to the official Forest Service inventory figures presented on pages 12 and 13, progressive change in measurement terms and techniques partially invalidates comparison between these estimates and has probably caused both an understatement of the decline in standing volume and an overestimate of the gain in growth rates.

Yet, the series as a whole is of sufficient accuracy to indicate the trend directions correctly. Thus, although the uptrend in growth indicated by the series is probably too steep, nevertheless, the actual growth trend is definitely up. The implications of any single inventory become fully apparent only when considered in relation to the approximate trends established by the findings of previous and subsequent surveys.

With respect to the drain-growth ratios for any one given year, however, drain and growth have both been measured in the same terms. Therefore, the fact that the terms have changed over the years to include more species and smaller trees does not affect the validity of comparing the ratio for one year with that for any other. The trend of succeeding ratios presents a relatively accurate picture of the rate at which the gap between growth and drain is being closed.

The near-balance in the "all timber" figures certainly does not reflect the fact that our large trees are still being cut or destroyed faster than they are being replaced by growth, that the quality of our forest resources is still deteriorating, that softwoods are being replaced by less desirable hardwoods, and that serious local shortages of timber are resulting in consequent injury to the forest-dependent communities involved.

The significance of these facts, however, is qualified by rapid technological advances in the conversion of wood that have permitted the increasing use of smaller and smaller trees in the manufacture of products that formerly required large logs and have developed many new and expanding uses for wood as cellulose, irrespective of the size of the trees from which it is derived. This trend emphasizes the relative importance of the "all timber" figures as opposed to those for sawtimber alone and tends to render somewhat artificial the size distinctions that separate the two categories.

A part of the excess of drain over growth of sawtimber is attributable to the fact that much of our present cut is in western old growth stands which produce but slight net increment. However, the objective of attaining a balance between growth and drain is not an end in itself. It is, rather, a step toward a broader aim; a forest situation in which most of our commercial timberlands will be producing capacity sustained yields of commercially desirable wood, marketable at a price that will insure adequate incentive for the continuous growing of tree crops.

## U. S. FOREST AREAS (1945)

(Million Acres)

Land area of the U. S. \_\_\_\_\_ 1,904  
Total forest land \_\_\_\_\_ 624

Less:

Area unadapted to commercial operation (in pinyon, chaparral, inaccessible mountain stands plus 13 million acres in Parks and game preserves) \_\_\_\_\_ 163

The extent of our commercial forest lands \_\_\_\_\_ 461

Almost one-third of the land area of the U. S. is forest land.

The above figures do not include Alaska or other Territories.

Much of the forest area unadapted to commercial operation has value for watershed protection, grazing and wildlife habitat.

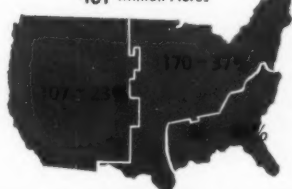
Most of the commercial forest land is better suited by soil type to the growing of tree crops than to any other purpose. Much of it is either too rough or too steep to be adapted to agriculture. Although regional changes are to be expected as farmlands are allowed to revert to forests and as timber is cleared for a variety of purposes, etc., it is generally expected that the total acreage of commercial forests will remain relatively stable.

The most recent comprehensive survey of U. S. forest resources, conducted by the Forest Service, relates to the status of 1945. A new appraisal, the Timber Resources Review, is scheduled for completion in 1954.

## REGIONAL DISTRIBUTION OF THE COMMERCIAL FOREST RESOURCE

### Commercial Forest Area

461 Million Acres



### Standing Supply

470 Billion Cu. Ft.



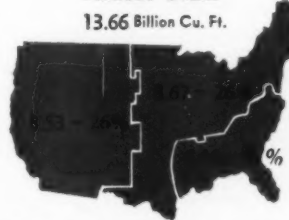
### Annual Growth

13.37 Billion Cu. Ft.



### Annual Drain

13.66 Billion Cu. Ft.



The dividing line between the North and the South runs through Oklahoma and Texas to conform to the location of regional forest types.

The term "East", also used by the Forest Service and referred to in our tables, includes the North and South together.

The above figures apply to "all timber"—that is, all merchantable trees 5" DBH (Diameter Breast High) and larger. This category includes saw timber.



# PATTERN OF OWNERSHIP OF OUR COMMERCIAL FORESTS

	1945 (Millions of Acres)		All Holdings	% of Total
	Large & Medium Holdings (over 5,000 acres)	Small Holdings (under 5,000 acres)		
<b>PUBLIC</b>				
National Forests .....	74			16%
Other Federal .....	15			3%
State and Local .....	27			6%
<b>Total</b> .....	<b>116</b>	<b>0</b>	<b>116</b>	<b>25%</b>
<b>PRIVATE</b>				
Lumber Companies .....	27	10		8%
Pulp Companies .....	14	.5		3%
Farmers .....	3	136		30%
Others .....	40	114.5		33%
<b>Total</b> .....	<b>84</b>	<b>261</b>	<b>345</b>	<b>75%</b>
<b>Grand Total</b> .....	<b>200</b>	<b>261</b>	<b>461</b>	<b>100%</b>

All public ownerships have been listed under "Large Holdings," though many individual units are small and scattered. There are 149 National Forests, exclusive of Alaska and Puerto Rico, with an aggregate area of approximately 200 million acres, including some 40 million privately owned in scattered parcels within National Forest boundaries. The National Forests are administered by the Forest Service, a division of the Department of Agriculture.

"Other Federal" includes forest lands under the administration of the Department of the Interior, Defense, etc.

"Local" public forests include county, town and community forests.

Some 3600 owners hold the 84 million acres in large and medium private holdings. In this category, "others" include railroads, mining companies, miscellaneous industrial concerns, estates, banks, insurance companies, speculators and timber interests that have no manufacturing facilities.

"Small Holdings," exclusive of those held by lumber and pulp interests, are owned by some 3,200,000 farmers and 1,000,000 non-farmers including merchants, real estate companies, professional men of all kinds, etc.

# DRAIN, GROWTH AND SUPPLY

## "ALL TIMBER"

### Definition:

"All timber" includes all merchantable trees 5 inches DBH and larger. This category therefore includes sawtimber and pole timber trees.

"All timber" is measured in CUBIC feet. The cubic foot volume represents the total usable wood content.

The conversion factor: 6 board feet of sawtimber equals one cubic foot.

### THE POSITION OF "ALL TIMBER" (As expressed in millions of CUBIC feet)

	1920	1930	1938	1945
1. Volume of Standing Timber.....	745,600	486,800	519,100	470,000 (1)
2. Annual Growth or Crop.....	6,000	8,900	11,300	13,370
3. Annual Drain .....				
a) Fire .....	1,100	900	900	460 (2)
b) Insects & Disease.....	650	1,000	1,200	1,020 (3)
c) Cut for Use .....	24,300	14,500	11,400	12,180
<b>Total Drain</b> .....	<b>26,000</b>	<b>16,400</b>	<b>13,500</b>	<b>13,660</b>
4. Depletion (#3 less #2).....	20,000	7,500	2,200	290
5. Drain/growth ratio .....	4.3/1	1.8/1	1.2/1	1.02/1

NOTES: (1) Approximately 67% of this volume consists of sawtimber.

(2) Average for 10-year period, 1934-43.

(3) Including loss to windstorm and miscellaneous causes of 400 million cubic feet. The loss to insects and disease was therefore 620 million cubic feet.

(4) The gain in volume between 1930 and 1938 obviously contradicts the data on line #4; namely, a regular annual depletion or net loss. The Forest Service explains this contradiction by discounting the comparability of its 1938 inventory.

(5) These figures have been rounded and are therefore approximate. The above table, taken from "American Forest Policy," is based on official U. S. publications.





### Definition:

"Sawtimber" includes merchantable trees large enough to yield logs for lumber, regardless of actual use, in accordance with the practice of the region, as follows:

Region	Minimum Size (1945)
<b>East:</b>	
Softwoods .....	9 inches DBH
Hardwoods .....	11 " "
<b>West:</b>	
Pines .....	11 " "
Douglasfir .....	15 " "
Redwood .....	23 " "

Sawtimber is measured in board feet. A board foot is a theoretical one foot square and one inch thick. The board foot volume of a tree represents only that part of its contents that can be sawn into lumber:— and is confined between stump-height and that point on the stem where branches, deformity or diameter make it unusable for sawlog purposes.

\* \* \* \* \*

### THE POSITION OF SAWTIMBER (As expressed in millions of BOARD feet)

	1920	1930	1938	1945
1. Volume of Standing Timber.....	2,214,900	1,667,800	1,763,700	1,601,000
2. Annual Growth or Crop.....	9,700	11,700	32,000	35,300
3. Annual Drain .....				
a) Fire .....	2,250	1,400	1,400	860 (1)
b) Insects & Disease .....	2,500	3,400	4,000	3,370 (2)
c) Cut for Use .....	51,400	54,600	42,400	49,660
Total Drain .....	56,100	59,400	47,800	53,890
4. Depletion (#3 less #2).....	46,500	47,700	15,800	18,590
5. Drain/Growth Ratio .....	5½/1	5/1	1½/1	1½/1

NOTES (1) Average for 10-year period 1934-43.

(2) Including loss to windstorm and miscellaneous causes of 1440 million board feet. The insect and disease loss was therefore 1930 million board feet.

(3) These figures have been rounded and are therefore approximate. The above table, taken from "American Forest Policy," is based on official U. S. publications.

# THE OWNERSHIP AND LOCATION OF SAWTIMBER

1945  
(Billions of Board Feet)

	West	East	U. S. Total	% of Total
<b>PUBLIC</b>				
National Forest .....	496	22	518	32%
Other Federal .....	98	6	104	6%
State and Local .....	52	13	65	4%
<b>Total</b> .....	<b>646</b>	<b>41</b>	<b>687</b>	<b>43%</b>
<b>PRIVATE</b>				
Farm .....	34	210	244	15%
Other (including industry) .....	363	307	670	41%
<b>Total</b> .....	<b>397</b>	<b>517</b>	<b>914</b>	<b>57%</b>
<b>All Owners</b> .....	<b>1043</b>	<b>558</b>	<b>1601</b>	<b>100%</b>

Thus, 43% of our sawtimber is on the 25% of the commercial forest area that is publicly owned. Almost two-thirds of our sawtimber is in the West. Over 60% of the West's sawtimber is publicly owned, mostly in National Forests. However, the private timber, located largely in Washington, Oregon and California, is more accessible and of better quality.

The East, with over three-quarters of the commercial forest area, holds only 35% of our sawtimber. Some 92% of the East's sawtimber is privately owned.

Nation-wide, more than one-fourth of the *private* sawtimber is on farms. In the Douglas fir subregion of the Pacific Northwest, however, farms have only 4% of the private total.

# SAWTIMBER LOSSES IN RELATION TO GROWTH

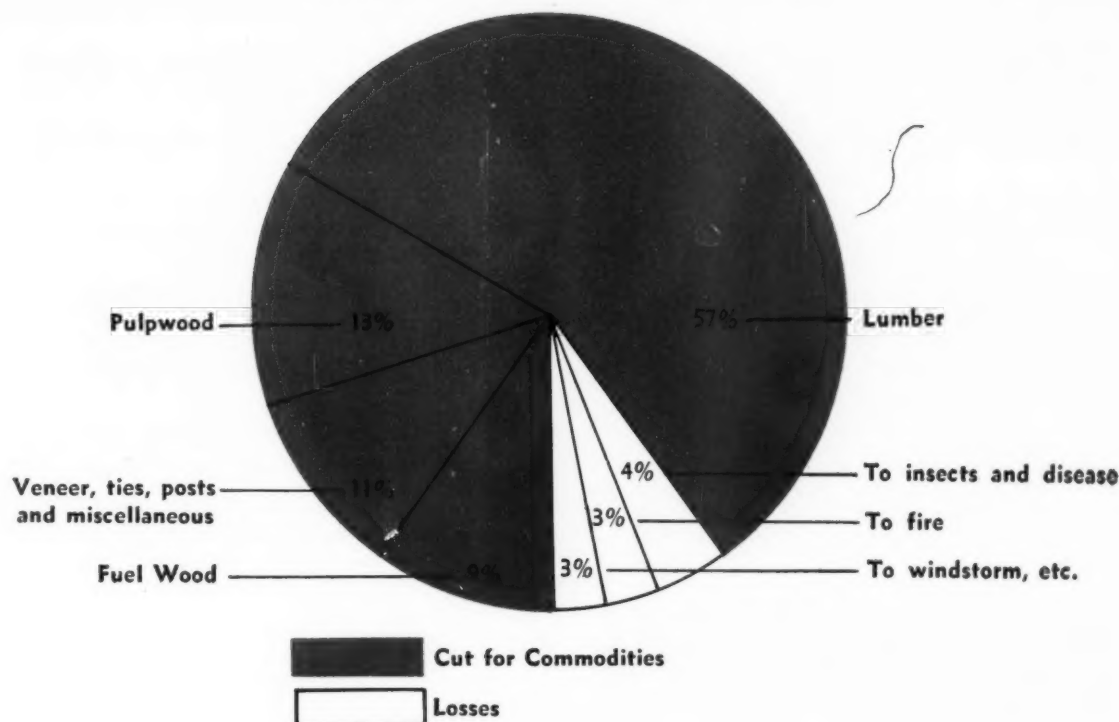
(Millions of Board Feet)

Losses					
	Annual Growth	Insects, Disease, Windstorm, etc.	Fire	Combined	Total Losses in Relation to Growth
1945 .....	35,300	3370	860*	4230	12%
1938 .....	32,000	4000	1400	5400	17%
1930 .....	11,700	3400	1400	4800	41%
1920 .....	9,700	2500	2250	4750	49%

\*Average for 10-year period, 1934-43.

The table represents the Foundation's computation, based on foregoing figures.

# SOURCES OF "ALL TIMBER" DRAIN—1950



## USE OF PULPWOOD AND PULP PRODUCTS IN THE U. S. 1950

### PULPWOOD:

Receipts of domestic pulpwood at the mill	20,702,000 cords
Net imports	1,826,000 "
<b>Total Receipts</b>	<b>22,528,000 "</b>

100% of imports were from Canada.

### WOOD PULP:

Domestic production	14,811,000 tons
Net imports	2,289,000 "

### "New Supply"

72% of imports were from Canada.

### USE

For making paper and board	16,300,000 "
For making rayon, cellophane, plastics, etc.	700,000 "

### PAPER AND BOARD

Domestic production	24,377,000 tons
Imports — 5,007,400 tons*	
Exports — 372,700 "	
<b>Net imports</b>	<b>4,634,700 "</b>

<b>Total</b>	<b>29,011,700 "</b>
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\*Of which 4,863,000 tons were newsprint, largely from Canada. This represents about 84% of our newsprint needs.

### Approximate increase in per capita consumption of paper and board:

	Volume	Per Capita
1950	29,000,000 tons	382.5 lbs.
1899	2,168,000 "	58.0 "

(The above information was supplied by the American Paper & Pulp Association.)

## STATUS OF FIRE PROTECTION AND CONTROL 1949

	On the National Forests	On the State and Private Forests Protected Area	On the State and Private Forests Unprotected Area
Extent of Area (millions of acres) .....	195	356	70
Number of Fires .....	11,500	78,650	105,500*
Acres Burned .....	191,000	2,320,000	12,760,000*
% of Area Burned .....	0.1%	0.65%	15½%
Tangible Damage .....		\$8,000,000	\$32,600,000

\*Estimated.

The National Forest acreage burned included some 35,000 acres of private lands inside the boundaries.

Since 1949, the state and private area under protection has been extended and now totals 363 million acres; — leaving some 63 million still unprotected.

The total forest area burned in 1949 — 15,400,000 acres — was the lowest in our history up to that time. The record for 1951, however, was 10,780,000 acres; — an improvement of more than one-third.

Indirect fire-losses include soil damage, erosion, floods, irregular stream flow, destroyed game habitat, etc.

## CAUSES OF FOREST FIRES ON PROTECTED LANDS 1951

Incendiary .....	39,400	37%
Debris burners .....	19,600	18%
Smokers .....	18,400	17%
Miscellaneous .....	12,000	11%
Lightning .....	7,000	6%
Campers .....	3,400	3%
Railroads .....	3,250	3%
Lumbering .....	2,750	2%
	105,850	100%

Over 90% of the incendiary fires occurred in the South; — a reflection of traditional woods-burning for a variety of agricultural and other purposes.

The figures do not include "controlled burning" used by foresters as a silvicultural tool.



## INCREASE OF FIRE PROTECTION ON NON FEDERAL LANDS

	State & Private Area Under Protection (Millions of Acres)	Approximate Annual Cost
1951 .....	363	\$33,000,000
1949 .....	356	29,000,000
1923 .....	166	2,000,000
1912 .....	61	234,000

The above areas include watershed lands as well as commercial forest.

The total area of state and private forest lands requiring protection from fire is 426 million acres. As of 1951, the coverage was therefore 85%. Some 63 million acres are still unprotected: — about two-thirds in the South.

Currently the federal government is meeting about 30% of the cost. However, Public Law 392 authorizes a gradual increase of federal expenditure up to a maximum of \$20 million in 1956. The total cost of protecting the entire area is estimated to exceed \$50 million.

The cost figures in the above table do not include additional expenditures by forest industry, now totaling well over \$5 million a year.



## FOUNDATION'S SUMMARIES OF VIEWS EXPRESSED BY THE FOREST SERVICE, INDUSTRY AND BY DR. LUTHER GULICK

### Drain, Growth and Supply

#### Foundation's Summary of Forest Service Views

Efforts to manage, protect and build up the nation's depleted timberlands are still inadequate, despite recent progress. Prospective requirements for wood are very high. Population is growing fast. There has been a great rise in wood-using industries — especially in the South. The problem of world timber supply, particularly of softwood timber, has become more acute. World War II proved that wood is just as essential as steel, aluminum or coal. Though the growth of timber has been increasing, its quality has become poorer all the time. Our need for sawtimber products is greater than the present cut.

Despite recent and encouraging advances, destructive cutting and lack of management have dangerously reduced our timber capital or growing stock and caused an unbalanced geographic distribution of the resource. The extent of denuded land and the widespread occurrence of poor stocking and inferior quality indicate that much of the productive capacity of the land is going to waste.

Sawtimber drain still exceeds growth and the quality of the stand is deteriorating in respect to species, size and condition. The near balance in the "all timber" figures cloaks the fact that 80% of that drain is in sawtimber, particularly the more desirable softwoods, while much of the "all timber" growth is in small, low-grade trees and inferior hardwoods.

The over-all figures are also misleading because they do not reflect wide regional differences as to forest conditions, and stages of depletion, with attendant maldistribution of our standing supply.

The drain of sawtimber in 1947 approached 60 billion board feet (compared with 53.9 in 1945 and 59.4 in 1930). Almost one-half of the "all timber" drain occurs in the South which has only 28% of our timber ("all timber"). Much sawtimber is cut for fuel, even though it is more valuable for other products.

In the 15 states that contain 60% of our sawtimber supply and account for almost three-quarters of the annual drain the stand declined 14% from 1933-1945. The drain in the West is not currently dangerous because of the backlog of mature virgin timber. In the East, (North plus South) continuation of the present rate of drain will sacrifice future productivity. The rate will probably fall, however, because it is already difficult to obtain stumpage.

Over one half of our sawtimber growth is in the South and only one quarter in the North, which has almost as much commercial forest land.

In the West, timber growth should increase as over-age trees are cut selectively from some virgin forests, that make little or no net growth.

About 40% of the West's commercial forest is still virgin. In the East practically all the forest land has been cut over one or more times; current

growth measures the extent to which present practices utilize the productive capacity of the land.

On many parts of our National Forests, sustained yield operations at maximum capacity will remain unattainable until growth rates are increased through conservative cutting and protection. On several million acres no cutting operations exist for lack of access roads, particularly in the West.

Growing stock of sawtimber has declined more than 40% since 1910. Today less than 50% of our commercial forest bears stands of sawtimber, and growth rates are far below productive potentials.

On our commercial forest lands as a whole, timber growth on the average is only about half of what the land could and should produce. Until poor and destructive cutting becomes the exception and good management is much more widely prevalent, the over-all situation cannot be considered satisfactory.

In Western Washington, less than half the primary forest industries have enough private timber in sight to keep going more than a few years. Veneer manufacturers are having to turn to lower-grade hardwoods. Many pulp and paper companies are meeting stiff competition for softwood timber. In the South, hardwoods are replacing the more desirable pine. The over-all figures superficially indicate an improvement during the period 1934-1944 but a breakdown of the figures reflects deterioration of the forest.

Shrinkage and deterioration of our growing stock is the core of the problem. The depletion trend must be reversed if our forests are to make their full contribution to the economic life of the nation.

In the 50 years since forestry began to gain some recognition, an encouraging start has been made toward its general application. However, the fact remains that some 64% of timber cutting on all private lands is still poor or destructive. In view of the total job to be done, there clearly is no ground for complacency.

The most significant progress in private forest management has taken place on the large industrial holdings, which showed good or high-order cutting practice on 29% of the operating acreage in the 1945 survey. There are factors favorable to continued progress: the present high rate of industrial production and generally good business conditions; the strong demand for all kinds of forest products at good prices; improved systems of taxation of forest land in a number of states; new uses for wood and its derivatives and improved practices in milling and processing which make possible the reduction of waste and the marketing of by-products; mechanical aids, such as power saws and better skidding and hauling equipment, that reduce labor requirements; and increased assistance from public agencies in protecting the forest from fire, insects and diseases.

These factors make for a situation favorable for practicing forestry, for those owners who wish to do so. But some of these things also make destructive

cutting currently profitable. Many owners are cashing in on their timber holdings while they are sure the returns will be high. Present profits mean more to them than sustained future income. It is perhaps not an American characteristic to take many long looks at the future.

Some other conditions also work against the progress of private forestry, though these may be overlooked in times of good business. Among the adverse factors are: tangled land-ownership patterns; over-size plants and excessive mill capacity in relation to timber supplies; high property taxes in some localities; unsound financing and the resultant pressures for liquidation; and the difficulty, cost, and time required to put deteriorated woodland on a good management basis. Serious repercussions could be caused by war or depression.

Current prices are so high that liquidation-cutting may make the most money.

The medium and large commercial forest holdings (over 5000 acres) total about 84 million acres. But there are 261 million acres of commercial forest land in more than 4 million small holdings, farm and non-farm. And it is on these lands in small ownerships that forestry has made the least progress. On these lands more than 70% of all cutting is still poor or destructive.

Good management on private forest lands yields important public benefits; greater assurance of an adequate, continuing supply of forest products, protection of watersheds, more game and fish, improved recreational values. Lack of adequate management can be seriously detrimental to the public welfare.

The public values in good forest management frequently outweigh the cost to the public of removing the obstacles to private forestry and promoting its advancement.

It is essential to consider standing timber as forest capital on which the annual growth accrues as interest, rather than as an investment or reserve awaiting utilization. To maintain annual crops of merchantable timber there must be a succession of age-classes so that as trees are cut each year new ones will be ready to take their places. Until the productive capacity of the land is reached, the more growing stock the greater the annual growth and the greater the ultimate crop.

Since 1900 a great deal has been learned about reproducing and growing crops of trees, but we have not discovered the means to get this knowledge generally applied. We still have a very long way to go to achieve a satisfactory forest economy.

The solution of the problem centers on the small private owner. Although we have the beginnings of an effective aid program, the current sporadic attack is inadequate. We need an integrated forest policy and concerted action backed by comprehensive, cooperative federal-state regulation of private forest practices.

To meet the prospective future needs of the United States, it is estimated that our annual growth of sawtimber should be about doubled. And our present growing stock, viewed nationally, is not sufficient even to sustain the present annual cut.

Time is running short. Even if the best of forestry practice were applied everywhere immediately it would be many years before growing stock could be built up to the needed level. Meanwhile the nation's use of sawtimber products in the years just



ahead must come from an inadequate growing stock. Before adequate sawtimber growth rates can be achieved, a period of limited supply of sawtimber products seems inescapable. Shortages of some kinds of timber and of certain high-quality products already are being felt. The longer we delay in getting our forest resources on an upward trend, the greater will be the reduction in the use of timber products and the longer the time needed to reach our growth goals.

Our present strength and future security depend in part on the abundance and productivity of our forests. The values at stake involve industry, labor, the tax base and the perpetuation of our free institutions. Faced as we are with the possibility of a continuing emergency in world politics it is obvious that we must make wise use of our forest resource which is so essential to our defense, as well as to our standard of living.

\* \* \* \* \*

#### Foundation's Summary of Industry Views

Our forests are not so meager as to cause alarm nor so abundant as to justify complacency.

Since 1918 the drain on sawtimber has remained about level. Drain on "all timber" has been reduced 50%.

In the same period, growth rates of both sawtimber and "all timber" have increased steadily. The growth trend continues upward. The annual growth rate of sawtimber is now  $3\frac{1}{2}$  times that of 1909-1918 — that of "all timber" more than double.

The ratio between drain and growth of sawtimber, from 1920 to 1945 has improved from a depletion of five to one, and is now only  $1\frac{1}{2}$  to one. That for "all timber" is now nearly in balance. New wood grown each year is 98% of the amount removed and destroyed. Moreover these ratios do not reflect a potential of growth not stressed by the Forest Survey figures. We have been closing the gap in both categories.

Fire protection has been vastly improved. In 1912 only 60 million acres of state and private forest land were under organized protection. The current total exceeds 360 million. The loss of 10.8 million acres to fire in 1951 was the lowest in our history. Sixty-seven percent of that loss occurred on land still unprotected — mostly in the South.

Today, over 80 million acres of private forest are under management that provides not only harvest cuttings which keep the land growing repeated forest crops of the better species but also protection from fire, insects, disease and destructive grazing. The bulk of this area is held by lumber and pulp manufacturers. In addition, about 89 million acres of federal forest are under good management — and some 12 million acres of state and other public woodlands receive at least fair management. Thus,

over 35% of our commercial forest is being managed for the continuous growth of forest crops.

Early predictions of timber famine have not materialized, due largely to the fact that they discounted the potential of growth. In 1920 the South was considered "cut out," yet during the period 1945-47 the South furnished an average of more than 38% of the nation's total production of lumber, and 42% of our pulpwood to supply the expanding pulp and paper industry.

Our forest industry is in transition from an economy of liquidation into one of new forest growth — the growing of trees as a crop. We are shifting from the old concept that "wood is where you find it" to the new one that "wood grows on trees." Thus, the former, static point of view is being replaced by a recognition that the forest is alive, dynamic and subject to change. The concept of continuity in the life of a forest is becoming increasingly prevalent. This is a big step ahead. Cutting according to plan distinguishes modern lumbering from that of the past.

Large numbers of people still think that when trees are cut, the result is fewer trees left. They don't consider wheat or corn in this light because they know that a new crop comes up every year. Actually, a new crop of trees comes up every year, too — billions of seedlings. About 90% of our forest land today bears current tree crops. Trees, like other plants, die from old age unless harvested. These facts are forgotten because the life span of a tree is long. The current crop cycle for pulpwood is about 15 to 60 years; that for sawlogs from 50 to 100 years. The length of these cycles has thus tended to delay the adoption of good forest practices.

Until 1940, the best old-growth timber could be bought for less than the cost of growing poorer trees. Treating timber as a crop thus became practical only when it became profitable. Good private forestry will be practiced when and where it pays.

The fact that virgin supplies are now limited is encouraging increased protection, closer utilization, and tree farming. Laboratory research is enabling mills to use more types of wood for an increasing variety of valuable products. Wood cellulose is now widely used as a base in the manufacture of rayon and other synthetic textiles and is the raw material for cellophane and many plastics. Also we are now able to use smaller trees in turning out products that formerly required large logs.

Not only are we thus experiencing a fuller use of our timber, but the accelerating adoption of better forest management promises increasing yields. It is probable that our timberlands can produce at least twice as much cellulose per acre as they do now. Thus we should be able to use a greater volume and still maintain a standing inventory far larger than today's. Man, cooperating with Nature, can provide new forests as good or better than the original virgin stands.

Nevertheless, much more needs to be done to expedite current favorable trends and achieve maximum productivity.

Fire protection needs to be further extended. Nine out of ten fires are man-caused and preventable; a matter of organized education.

Today, more than twice as much sawtimber is ruined each year by insects and disease as is destroyed by fire; and almost 50% more "all timber." Powerful, new insecticides are now available, however, and the replacing of vulnerable old stands of virgin timber by thrifty, young trees will minimize the effects of disease. A concerted attack on the problem of losses caused by insects and diseases, based on the provisions of the Forest Pest Control Bill of 1947, has only just begun. If the program meets with the same degree of success that has attended our efforts towards fire protection, the current annual loss to forest pests and blights will be reduced enormously.

Greater public understanding of the problems and nature of good forest management is needed. Due to the attacks of conservationists and others on the careless methods employed by many forest operators at the turn of the century, the public came to regard all logging as anti-social destruction. Despite the recent spread of improving forest management, a considerable remnant of this opinion still persists. It is abetted by the fact that most logging is still an unsightly operation that involves inevitable slash for which there is as yet no local pulpwood market in many areas.

Notable advances have been made by both industry and government in establishing a pattern designed to bring our forests into balanced, full production; and the rate of progress is constantly accelerating. Also there is continuous advance in both forest practice and wood utilization. These factors render the "famine philosophy" no longer tenable.

The crux of the situation lies with the woodlots. Admittedly, the bulk of the cutting practice on these small holdings is still poor, yet only recently has qualified advice become available to their owners. Real progress is now being made, however, both by public agencies and industrial foresters in arousing them to the profit possibilities of their woodlands and in providing them with management and marketing assistance.

As to future supply, the trend of growth has been up for 30 years. Even with the present rate of cut continued, it appears probable that the rising tide of good forest management will result in a balanced and more abundant forest economy.

#### Foundation's Summary of Dr. Gulick's Views

Annual drain of "all timber" has declined steadily since 1920, due to reduction in the use of wood and to better fire control, while growth has risen more than 100%, partly because virgin and hence stagnant forests have been replaced. Growth and drain are now nearly in balance and the prospect is that growth will exceed drain substantially in a few years.

The sawtimber situation is not so favorable. Annual drain has not dropped appreciably since 1920. Although annual growth has expanded by over 250%, we have been cutting and losing the larger trees to fire, insects and disease much faster than they have been growing. However, the depletion for 1945 was but 40% of that in 1920, and there has occurred a spectacular gain in growth. If the rate of improvement over that period is continued, drain and growth may be in balance by about



1960. Since our virgin stands will last well beyond that date, the immediate prospect is not serious provided we extend our fire protection and develop control of insects and disease.

Our national consumption of wood has been coming down as we have passed from a frontier country to an urbanized and developed land. The high point was passed in 1907. In the last 40 years, our per capita consumption of lumber has dropped from over 500 board feet per year to less than 250.

With rural prosperity and the use of coal, oil and electricity, the burning of wood for fuel will continue to drop. There has been a great decline also in railroad uses of wood. Poles, piling, ties, etc., are now creosote-treated so that they last longer. The greatest change, however, has come from the urban drift of our population. This reduces the lavish use of unpainted wood in farm buildings and increases urban home construction, which uses less wood per capita and tends more and more toward fire-proof construction and other materials.

The loss from forest fires has been reduced by 62% since 1910 and will continue to come down as our fire defenses improve. The loss from disease and insects is, however, reported to be on the increase, so that the total loss from fire, pests and disease is only slightly down. Still there are hopes for the future, especially as we use up our precious but over-age forests which are so susceptible to beetles, infections and windfall.

Another great advance is the increased efficiency in logging and milling, particularly in the larger sawmills. The economies achieved since 1910 may well be equivalent to 10% of the wood now cut.

In three industries wood consumption is rising. They are pulp and paper, packaging and wood chemistry. While the increases in these lines have been notable, the amount involved is still small compared with lumber and firewood. Thus their increase has not prevented the marked decrease in total wood consumption since the high point was passed in 1907.

A rise in wood prices tends to decrease consumption. Wood is displaced by other materials such as cement, metal and oil. A price rise also encourages economies in logging and milling, and the development of new processes to use wood "waste." Much of this waste, now dumped or burned, can be used commercially with the application of modern technologies. The effect of these economies is to increase the use of wood without increasing the volume of timber cut and removed.

The great problem is growth, dependent on protection and management. The best forest management is found in the National Forests, on the lumber and pulp company properties and on the larger holdings generally. This amounts to 158 million acres or about 34% of the total commercial forest. This forest land is now producing timber on a reasonable scale and will continue to improve under present management. For the long future, however, we must count on timber production from the woodlots.

The timber situation is apparently righting itself by three important developments: 1) government ownership of most of the less productive forest lands; 2) a rise in stumpage prices which will justify better management of private forests; and 3) the beginnings of new habits of forest culture.

However, it is evident that a better distribution

of our timber resources through the restoration of forests in the Northeastern and the Lake States would serve an important economic purpose. With the bulk of our timber now in the West and the South, it has been figured that about 30% - 50% of the price paid by the consumer for lumber goes for freight.

The last two wars have demonstrated that it is safe to count on United States and Canadian supplies as a single timber reserve. The security problem appears to be not the lack of timber but the lack of access and the shortage of certain high quality varieties.

The Reappraisal reported that 67 million acres required planting and another 23 million are in need of partial planting. Total planting up to 1948 is reported at 5 million acres, public and private. We have not yet scratched the surface. As to private lands, the reason is that owners have felt that the stumpage price they might receive was not enough to lead them to make the investment, assume the risks and wait for the profits.

As to public lands, appropriating bodies have not felt that the public would think the expenditure justified. Up to 1948, stumpage sold from public forests did not return enough to care for the woods and the other governmental forestry activities. Computations lead to the conclusion that planting will be the exception and that we will raise our timber where it will come up by nature provided it is given fire protection and other limited care.

About 50% of the wood cut in the forest is now wasted. There is thus considerable room for economy in the process of getting wood from the tree to the consumer. We are still notably deficient in the development of large integrated wood conversion mills. Our wood-using industries tend to specialize in their output and thus to waste a large part of their raw materials. In spite of spectacular advances in wood utilization in the past two generations, the forest product industries as a whole, excluding the chemical use of wood and paper, show the smallest increase in productivity per worker of any major industrial group.

Although we have been reasonably successful in advancing the science of managing the forests and in developing new wood products, we have been decidedly weak in applying technology to the economical use of all the timber which is cut.

In the past generation, however, private enterprise has greatly improved forest management wherever forest land is held by corporations with extensive investments in mills and, to a lesser degree, where it is held in large blocks by corporations or individuals who regard forestry as their chief activity. Many such properties are better managed than any except the "show spots" in federal, state or university forests.

Thus it would seem that the wastefulness of the private enterprise system as applied to forestry is to some extent a thing of the past or is so inextricably involved in farm holdings that the problem cannot be solved by extending public ownership.

With respect to the "other values" of our forests, including the protection of water, the restraint of floods, soil conservation, provision of wildlife habitat and grazing, plus the maintenance of opportunities for recreation, existing programs have no more than scratched the surface. We have not yet discovered how private owners of watershed lands



should be induced or forced to recognize their responsibility. We need a great deal more research and knowledge.

There will be no timber famine on this continent over the next generations if we continue effectively with existing forest programs, though there may be one or more periods of limited stringency at 15 or 20-year intervals over the next 50 years as our timber economy shifts from an inventory to a crop status.

As a raw material, a plentiful supply of wood is a great national asset, but wood is not a fundamental necessity for a comfortable scale of living. There

## CHARACTER OF CUTTING

### Forest Service Criteria Used to Rate Cutting Practice

#### High Order

The best types of harvest cutting that maintain quality and quantity yields consistent with the full productive capacity of the land.

#### Good

Cutting that leaves the land in possession of desirable species in condition for vigorous growth.\*

#### Fair

Cutting that will maintain any reasonable stock of growing timber in species that are marketable.

#### Poor

Cutting that leaves the land with a limited means of natural reproduction, often causing deterioration of species with consequent reduction in both quality and quantity of growth.

#### Destructive

Cutting that destroys both timber values and the means for natural reproduction.

\*It is suggested by Western owners that this definition precludes a classification of "Good" for much well-managed land in the West, where good silviculture involves block-cutting and state laws require the burning of logging debris. Such land is not left "in possession" of desirable species although these seed in later on.

## Background

Approximately 55% of the commercial forest is held by over 4,200,000 owners in the form of woodlots. This aggregate area represents three quarters of the private commercial total. The average holding is 62 acres. Three quarters of these owners are farmers;—who hold 55% of the woodlot area and about one quarter of our private sawtimber. The balance of the area is held by over a million non-farm owners, many of whom are absentee.

## Distribution of Small Private Ownerships 1945

	Commercial Forest (Millions of Acres)		Percentage in Small Private
	All Holdings	Small Private Holdings	Small Private Holdings
North	170	118	69%
South	183	122	67%
West	107	21	20%
Total	461	261	57%

In both the North and the South, about 12% of the above small ownerships are non-operating. In the West, 35%.

## Facts and Figures Subject to Interpretation

Except as otherwise noted, the tables presented in this report derive from Forest Service publications:— principally the "Reappraisal of the Forest Situation in the United States" and recent Annual Reports. Data on growth, drain and supply represent the findings of four surveys conducted by the Forest Service as presented respectively in the Capper Report of 1920, the Copeland Report of 1930, the Joint Congressional Committee Report of 1938, and the Reappraisal of the Forest Situation of 1945. The completion of each of these surveys required an extended period; the dates assigned are therefore arbitrary.

## BY CLASS OF OWNERSHIP

1945

Ownership Class	Commercial Forest Area (million acres)		Character of Cutting		
	Total	Operating	Good or Better	Fair	Poor or Worse
<b>PUBLIC</b>					
National Forest		64.8	80%	19%	1%
Other federal		12.5	43%	32%	25%
State and local		23.5	47%	10%	43%
<b>Total</b>	116.0	100.8	67%	19%	14%
<b>PRIVATE</b>					
Miscellaneous		129.7	5%	30%	65%
Farm		123.4	4%	23%	73%
Lumber Co.		34.4	25%	27%	48%
Pulp Co.		14.5	33%	49%	18%
<b>Total</b>	345.0	302.0	8%	28%	64%
<b>ALL LANDS</b>	461.0	403.0	23%	25%	52%

NOTES: (1) Above percentages refer to operating areas.

# PROPORTIONS OPERATED UNDER "FAIR" OR BETTER CUTTING PRACTICE

By Ownership Class

1945

Class	Operating Commercial Area (Millions of Acres)	%	Under "Fair" or Better Practice Area (Millions of Acres)
<b>PUBLIC</b>			
All public .....	101	86%	87
<b>PRIVATE</b>			
Large holdings .....	49	68%	33
Medium holdings .....	29	39%	11
Small holdings .....	224	29%	65
<b>Total Private</b> .....	302	36%	109
<b>Total All Ownerships</b> .....	403	48%	196

Medium holdings are those from 5000 to 50,000 acres.

# CHARACTER OF CUTTING ON PRIVATE LANDS BY SIZE OF HOLDINGS

1945

	Number of Owners	Commercial Forest Area Total-Operating (million acres)		Good or Better	Fair	Poor or Worse
Large .....	400	51	49	29%	39%	32%
Medium .....	3,200	33	29	8%	31%	61%
Small .....	4,200,000+	261	224	4%	25%	71%
<b>Totals</b> .....	4,203,600+	345	302	8%	28%	64%

are many substitutes, the use of which will be determined by competitive prices. We do very well building up timbers and panels to take the place of the large logs and wide boards we used to get, but it costs time and energy, and in many cases we turn to less desirable and more expensive substitutes because quality timber is not so easy to come by now. The issue is only between a moderate supply and an ample one. Both will meet effective demand, but at different price levels.

Thus we are not facing an emergency requiring drastic measures but can proceed with the development of a constructive forest program.

## Foundation's Summary of Forest Service Views

The small private holding is our toughest problem. These woodlots include much of the most accessible and potentially the most productive forest land.

The obstacles to better forestry on our woodlots stem from their multiplicity and include uneconomical size, owner's diversity of aims and lack of skill,

instability of ownership, lack of capital and pressure for current income.

Even with the advances made in aiding farm forestry, most farm woodlands are still subjected to thoughtless cutting, pasturing, and burning. Many woodlots have been overgrazed to the point where the growth of seedlings has been prevented. Most small woodlands today are run-down; careful handling is necessary to build up the growing stock. About 70% of the cutting practice is rated as "poor" or "destructive."

Most small owners lack the experience to perform or supervise the tasks of growing, harvesting and marketing timber. They need help and cannot afford to buy it. Here there is a constructive opportunity for public aid on a greatly enlarged scale. Better management of forest lands is being furthered by various industry programs such as American Forest Products Industries' "Tree Farm" campaign and the efforts of the Southern Pulpwood Conservation Association. Publicly-financed technical aid in harvesting and marketing has recently

been stepped up. However, the job of reaching more than 4 million owners is big and difficult.

Under the Forest Management Act and the amended Clarke-McNary Act, there is operative a small-scale program involving Forest Service cooperation with state agencies providing small owners, in both farm and non-farm classifications, with aid in planting, growing, harvesting and marketing of tree crops. In 1950, some 220 farm foresters were giving such on-the-ground assistance to farmers, small sawmill operators and other woodlot owners. Project areas now served include about 1000 counties.

Since the program started in 1940, more than 100,000 small holders have received help on a total of almost 11 million acres (about 4% of the total thus owned) and, with the farm foresters' advice, they harvested and sold about 3¼ billion board feet of timber plus other forest products for which they have received over \$48 million. Much lumber, fuel wood and other products were also used on the farms concerned. Many of these woodlands are now producing regular timber crops at intervals of 1 to 10 years.

By mid-1950, more than 4500 requests for assistance remained unfilled. An adequate program would involve projects in 2000 counties with a resident forester in charge of each, plus a corps of specialists on utilization. The program would be administered by the states and financed by both federal and state funds. Such a program should be backed by a campaign of education and demonstration. Extension services would play the key part. Currently they employ only 68 foresters. There is great need to step up such activity by all agencies, both private and public.

Cooperatives can and do contribute to the woodlot problem. But the movement has been sporadic; — many associations have failed. Since 1938 some 50-odd cooperatives have been engaged in marketing farm timber, mostly in the Lake and Northern states. This activity needs encouragement by public agencies.

The public has a big stake in this problem. The public role should be to help minimize the handicaps, to encourage and assist and to support appropriate restraints to stop unnecessary destruction.

For small owners, as for private forestry as a whole, there are two additional basic needs:

- 1) Low-interest-rate credit over long periods.
- 2) Forest insurance — commercial coverage at reasonable rates is now practicable in certain forest regions.

The present woodlot picture is largely one of mismanagement, neglect and destructive exploitation. If private forestry is to do the job that is required, it must do it on these small holdings. The practice of the small owner is the crux of our forest problem.

At the present time, the current sporadic attack on the problem is inadequate. We need an integrated policy, effective in all states, implemented by comprehensive regulation of cutting practices.

#### **Foundation's Summary of Industry Views**

The cutting practices on only 29% of our farm woodlots and other small holdings have previously been reported as "fair" or better. To correct this condition, forest industries are working alongside government agencies. Federal, state and industrial

foresters are cooperating. Hundreds of company foresters are in the field helping small owners. The emphasis is on profit and continuity of production.

Until recently, few woodlot owners thought of timber as a crop. Mature forests were abundant and good practice was considered unsound economics. Today, this attitude is changing; largely due to different requirements for wood products and to technical advances that enable the utilization of a greater part of each tree. An economic set-up favorable to the small owner has existed only since 1940. Previous to that date it did not pay him to grow trees. In the last decade the employment of good practices has trebled. In increasing numbers, our farm woodlot owners are becoming convinced that the cash return from good forest practice is well worth the effort involved.

Sponsored by industry and launched in 1947, the "Trees for America" campaign is designed to stimulate both production and protection of private woodlands, and is meeting with rapid acceptance. In Alabama, 75 foresters have volunteered to conduct demonstrations of forest practice and help individual owners.

Similar programs are under way in New Hampshire, Vermont, Virginia and Washington. In addition, The Tree Farm System is being increasingly adopted by small owners. Although the bulk of forest acreage certificated under this movement is on the large industrial holdings, about three quarters of its 3800 members are woodlot owners. American Forest Products Industries, Inc., administers both these programs. It also conducts an extensive educational service that supplies many of the nation's schools with current forest information.

In Wisconsin the "Trees for Tomorrow" campaign, backed by paper interests, is providing the small owners with both seedlings and management assistance. Southern pulp and paper companies employ more than 400 foresters and spend over \$1 million a year on supplementary fire protection. Extensive aid is given to the woodlot holder; and a forest training camp has to date instructed some 3000 farm students.

The crux of our forest problem lies with the small owners. How can they be induced to grow the most trees? Through regulation by a central government, or through education, understanding and self-interest fostered on state and local levels?

#### **Foundation's Summary of Dr. Gulick's Views**

The problem of future growth centers squarely on our woodlots. Exclusive of the small holdings of industry, our woodlots represent some 54% of the total commercial forest. They should be capable of producing not less than 30% - 40% of our total future supply and, at the same time, of greatly adding to the current income of the nation's farm areas.



Generally, a farmer can so manage his woodlot as to absorb only his otherwise unused time; usually winter work for a winter produce check, at a time when he can use the money. He can use land not adaptable to other crops and can develop young trees merely by protecting seedlings and watching for fire. His planting stock is usually available at cost, or less, and management advice is free. Thus the farmer can grow timber at little or no cost, save for the possibility of increased taxes. This is an important factor.

There are several reasons why so few woodlot owners have learned to seek help of a farm forester in selecting the trees to be cut and in selling their wood by species and by quantity. The program to educate these owners, farm and non-farm, has been initiated only recently and the value of woodlots is only just beginning to become evident to owners, county agents, agricultural schools and rural bankers. There has been no tradition of woods management in our rural life. Farms have changed ownership rapidly. In addition, woodlot income has been irregular and often out of relation to improvements made. Also, loggers prefer to clear-cut rather than to cut selectively.

To the uninformed woodlot owner, the benefits of forestry seem long-deferred; especially when he can sell his whole stand "now" for cash. Also, he runs the risk of fire and blight, and if he sells his farm he seldom receives extra for his timber. Thus the long crop-cycle plus ignorance of management and the difficulties of marketing are likely to affect his action. Part of the solution to the woodlot problem is therefore a question of effecting a change in farming habits.

The increase that has already taken place in the value of standing timber will encourage some small owners to invest more in managing and protecting their woods and to follow longer-range policy. But it may induce others to cut their growing stock as well as their mature timber in order to profit immediately from the new high prices. Thus the economic incentives that press the large owners toward sustained yield forestry may produce the opposite effect on many woodlot holders. If this proves to be the case, it will be necessary to alter the economic incentives or the framework of compulsion.

Although the questions of incentives and habits are yet to be solved, the woodlot situation is improving. Many factors point to continued higher production from our forests provided we give vigorous support to programs already initiated.

## Regulation of Private Forest Practices

### Background

Forests in private ownership constitute 75% of our commercial forest area. They include most of the best growing sites and accessible locations, and furnish 85% to 90% of our cut. Three quarters of this private forest area is held by more than three million farmers and one million non-farmers, many of whom are absentee. The average size of these small holdings is 62 acres. The remaining one-fourth of our private forest land is held by only 3600 owners divided into the two following classes: a) 400 large holdings of 50,000 acres or more, aggregating some 15% of the privately-held total, and b) 3200 medium holdings of 5000-50,000 acres—9%. Included in the above breakdown are the hold-

ings of wood-using industries. As of 1945, lumber manufacturers owned 11% of the private commercial forest, and pulp manufacturers 4%. Subsequent acquisitions of forest property by these interests, mostly from large non-industrial holders, has materially increased the percentages.

Although much of the cutting on the large holdings is rated by the Forest Service as "fair" or better, some 70% of woodlot cutting is rated "poor" or "worse."

The problem is how to assure continuing productivity in the face of the deterioration still occurring on so much of our privately owned forest land. Is government regulation necessary, and if so, what sort of regulation and by whom?

### Foundation's Summary of Forest Service Views

If our responsibilities to our own generation and our obligations to future generations are to be met, destructive practices in the forests must be stopped. Our forest growing stock must be built up. The bulk of this job will have to be accomplished on private lands, since three-fourths of our commercial forest land is in private ownership. Some degree of regulation is necessary; regulatory measures are essential in our complex economy. Rules of the game are as necessary to resource management as they are to transportation, communication and other enterprises that affect the public welfare.

Although we have the beginnings of an effective program of aids to small owners, a piecemeal attack will not suffice. We need a comprehensive, unified forest policy and concerted action.

Reasonable regulations covering forest practices should be adopted in all states and certain basic, nation-wide standards should apply. These standards should be set up through national legislation and would provide for federal financial aid to states that adopted and carried out state forest practice laws meeting those standards. They would also authorize the federal government to administer regulatory measures in any state which requested it, or which failed to put an adequate state regulatory measure into effect within a reasonable time.

The over-all basic framework, as expressed in a federal statute, would provide where applicable for restocking, prohibit premature or wasteful cutting in young stands, reserve for growth and subsequent cutting sufficient growing stock to keep the land as productive as practicable, prevent undesirable logging methods that cause avoidable damage to young growth, regulate grazing, prevent clear-cutting except where technically desirable, and provide for methods of protecting forest lands against fire, insects and disease.

Different rules of forest practice would be established for different forest regions. In addition, the statute would provide authority to except certain areas, establish advisory boards to help formulate the rules, and permit approval of working plans for individual properties in lieu thereof. It would not require sustained yield.

The Forest Service does not favor a provision that would permit the federal government to withhold cooperative forestry assistance to a state that fails to enact regulatory legislation meeting federal standards.

The two basic reasons why federal participation is necessary are that: 1) national interests are in-





volved, and 2) the states will not do the job alone.

Fire, insects and disease do not respect state lines. Neither do rivers whose headwaters arise on forest lands. Adequate forest resources are essential to national security, which is not a state responsibility. Also, the federal government should seek to protect the public investment being made in the cooperative aid programs.

Some 16 states have enacted laws designed to control destructive practices. The standards involved in all these measures are lower than desirable. Only about half of them involve any compulsion. Neither application nor enforcement has been notable. A federal statute would strengthen resistance of state officials to local pressures.

Those who advocate state regulation without federal participation either seek an avenue of escape, fail to recognize the national responsibility involved, or lack confidence in the ability of the states to do the job, because in a competent state the only federal participation after approval of the state statute would be financial.

The time has come for measures more decisive than education, although education must be continued. Regulation will not in itself bring about sustained-yield management of forests. It will still be necessary to encourage and help forest owners go beyond the minimum requirements of regulatory laws toward maximum, sustained forest production.

#### Foundation's Summary of Industry Views

Real progress has been made by both the states and private enterprise in the protection, use and increase of the forest resource.

The upholding by the U. S. Supreme Court of the constitutionality of the forest practice law of Washington settles any question as to a state's power to compel its citizens to reforest cutover land. The way is now clear for the people of any state to regulate their forests.

Since 1940, some 30 states have conducted studies of their timber resources, and ten have enacted legislation to influence or control cutting practices on private lands. This is an index of the awakening interest in better forestry. This legislation, together with similar statutes previously enacted in six additional states, stands on a wide base of public acceptance in the states concerned—an essential to good government and a prerequisite to constructive conservation.

The pattern of state solutions to the problem of controlling private forest practice includes a wide diversity and reflects the influence of local and traditional differences. In general, however, the emphasis is being placed on control through the medium of local district boards composed of forest owners, cooperating with state foresters.

In both Oregon and Washington, all commercial logging operations are licensed. The state specifies the size of the seed-blocks that must be left standing and regulates the burning of slash. Cutting in violation of the rules results in the owner or operator being required to replant or forfeit a bond, the proceeds of which are used by the state to restock the area. By 1948, there was reasonable compliance on 95% of the acreage logged.

In California, rules governing forest practice are laid down by district committees. If approved by the owners of two thirds of the local acreage and by the State Board, they take on the force of law. Although no provision has been made for enforcement, some 75% of the private cutting operations are now in compliance.

Maryland's state-wide cutting regulations of 1943 have been replaced by local rules formulated by regional boards. This has achieved the flexibility essential to the development of forest laws into workable instruments. Although the "advice" of the district boards is enforceable by fine or imprisonment, the Commission has chosen to elicit willing compliance through education. By 1946 over 90% of the forest operators were ready to cooperate.

Virginia specifies the minimum number and size of trees that loggers must leave standing but confines the application of the law to those counties whose local board of Forest Supervisors concurs. Over three fourths of the state's counties have adopted the code.

In New Jersey, woodland owners are supplied with free advice and aid if they agree either to abide by the cutting plans provided by the state or to pay reimbursement. One half the cut of private timber is now harvested under this system.

The New York Forest Practices Act of 1946 provides for voluntary cooperative agreement between the owner and the forest District. To date the holders of 3700 tracts, totaling more than 1,000,000 acres, have signed up. This is only about 10% of the state's private woodlands, however. As more owners come in it is possible that public demand will develop to force the others into line. Ultimately only a slight change in the law could make the forest standards compulsory.

Massachusetts requires notification of intent to cut and imposes compulsory prior consultation with state foresters but does not enforce the prescribed cutting code. Since 1945, some three fourths of the state's private cutting operations have met the specified standards.

New Hampshire has fixed a very low rate of property tax on forest land plus a yield tax of 10% at time of cut and offers a 3% rebate as inducement for compliance with cutting rules established by committees of local owners.

Several other states are in the process of developing their individual systems of forest education, inducement or compulsion. The combined influence of these various state approaches is producing a cumulative and very tangible effect.

The Forest Service plea for nation-wide controls

is based on the premise that our wood resource is deteriorating at a dangerously rapid rate and is inadequate to meet future demands; and that state regulation is not sufficient. This premise is open to question.

As to the legislation proposed by the Forest Service, exemplified by the Anderson Bill (S. 1820), the provision for federal enforcement in those states that fail to comply or request such intervention clearly involves the possibility of direct federal police action. Also, the bill would place an almost absolute degree of authority in the hands of the Secretary of Agriculture. The local boards established by the bill would be of a purely advisory nature.

The imposition of such an untried program on the whole country would jeopardize the progress already achieved by federal, state and individual cooperative effort. The rate of advance today precludes the necessity of resorting to the frustrating regimentation of federal controls.

#### Foundation's Summary of Dr. Gulick's Views

The issue of extending federal control to cover private cutting practices is currently the area of greatest controversy. The woodlot owner, however, is largely unaware of the discussion and also unconcerned.

The large timber interests are violently opposed, as they want no federal or state inspectors around telling them what they may do and how. They wish to make their own cutting and management policies as their economic interests seem to dictate. However, some members of the group are urging state cutting practice controls, partly to prevent federal action and partly because they know that the irresponsible management of timberlands by the few "bad actors" will jeopardize the standing of all timber owners in the eyes of the public.

The Governors' Conference opposes federal control as an invasion of state sovereignty and leans toward weak state enactments.

Most professional consultants and university professors of forestry oppose the imposition of federal regulations. Many advocate the extension of state laws designed to start as weak educational measures but to be developed eventually into vigorous controls.

There is no opposition to federal fire-prevention controls, involving private operations, under state administration with federal aid. Similarly, coopera-

tive federal-state control over insects and diseases is also acceptable.

Most state laws which seek to restrict private forest practices are designed to force owners of timberland and loggers to govern their cutting practices so as to prevent dangerous fires and to assure a future forest growth on the same land. These provisions are enforced through permits, licenses, inspections and the posting of bond for the fulfillment of conditions. The laws are extremely general, stating only the broad purposes. The state forestry department, or conservation commission, is left the authority to issue rules and regulations which have the force of law, including fines and penalties.

The legislative intent is clear but the standard of legislative delegation is shockingly inadequate. As a result, the "rules" which have been issued with the force of law are extremely vague and leave wide discretionary powers to inspectors and to local appointed committees. These committees are set up by districts, so that the "law" will certainly be a very different thing at different times and for adjacent timberland owners.

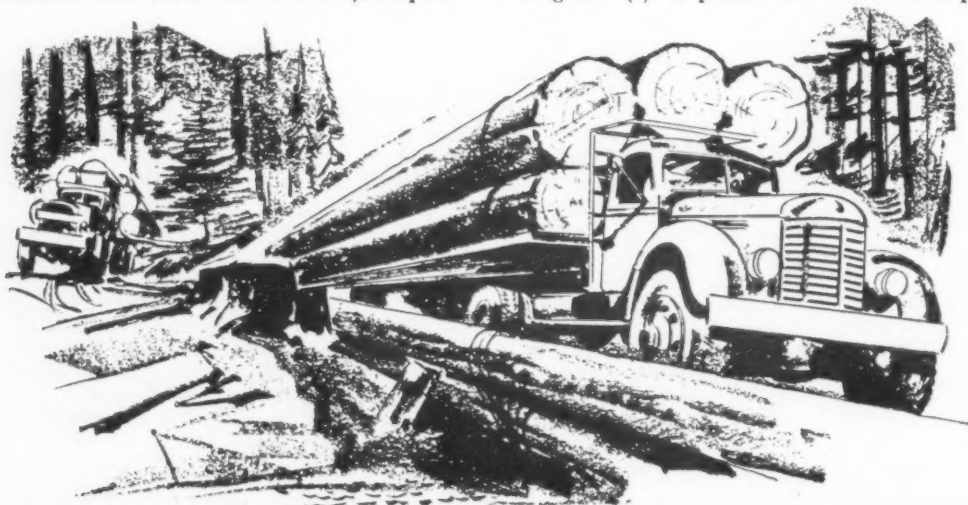
As to fire protection the required controls are clear, and their enforcement can be uniform. But as to selective logging or retention of adequate seed trees, or replanting, technology is still experimental, methods of experts differ, and even the best regulations now leave the decisions up to the local inspector and his local committee.

This does not give us "government of law" as our courts have developed the concept. It is perhaps significant that the forestry departments of the three states which now have cutting practice laws with penalty clauses are not in fact proceeding to enforce their rules and regulations except as to limited parts of the law and only in the case of a few notorious challenges to their powers.

The laws themselves, for all their enforcement provisions, are thought of as primarily "educational." This is not good law-making or good administration. What we need are clear standards of delegation, rules which can be and are enforced on a uniform basis, and adequate procedures to protect the rights of the individual.

Under the circumstances, any controls which seek to go beyond fire protection and responsible logging should be developed with the greatest caution.

What we need is real state control with active local backing and cooperation from timber groups, designed: (a) to prevent fire hazards and prevent



disease and pest contagions, and (b) to conserve water sources in those areas which are found to be important in the primary watershed. States should also be encouraged to extend their cutting practice education to develop sustained production and reforestation operations where appropriate. States should establish and enforce much more rigorous logging standards on commercial loggers and sawmills than at present. The loggers and mills are a strategic point of attack. They should be permitted to operate only under a license system with rigid inspection.

However, general cutting-practice controls aimed at long-run sustained-yield policies should not be

forced on any state by the threat of federal action. The impossibility of efficient forest law enforcement without the substantial backing of local public sentiment indicates that no forestry problem can be solved without regional public education adequate to evoke the needed state cooperation, particularly where federal financial aid can help to remove the economic deterrents to state action. The first essential for effective enforcement in any area is public education, and support by the general run of timber interests themselves. Any other policy will fall of its own weight, like National Prohibition in 1933, and will do infinite damage in the process.

## THE CONSERVATION FOUNDATION CONCLUSIONS

### Drain, Growth and Supply

With the end of the dominance of virgin timber now at hand, our forest economy is changing. Instead of relying on old growth timber, that in effect cost nothing to raise, we are becoming dependent on carefully planned and nurtured tree crops.

There is a strong trend among the larger units of the industry to acquire sufficient timberland, including cut-overs, to ensure a continuous supply of raw material. This trend has been speeded by the improvement in fire protection, the introduction of efficient harvesting equipment and the prospect of a continued strong demand for forest products.

Although there are some large converters of wood whose operations are still predicated on short-term liquidation, many of the big manufacturers of forest products are well started along the road leading to continuous sustained yield.

No precise official figures are available as to the proportions of the total cut of timber supplied by the various ownership classes. Recent estimates, however, indicate that about 40% of the cut is derived from large private holdings plus publicly-owned forests, and the balance from medium and small private ownerships. The table on page 20 shows that in 1945 about 48% of the operating commercial total held by all classes of owners, including public agencies, was under "fair" or better cutting practices. And considerable subsequent progress in both cutting practice and fire protection has occurred.

Since the rating of "fair" indicates the minimum level that will maintain a reasonable growing stock in marketable species, it is apparent that about half of our operating commercial forest is managed under cutting practices below that level, and half under practices that insure continuing stability of output. Only 50% of this latter half, however, is so managed as to leave the land in condition for vigorous growth.

Any attempt to project current trends of timber growth, drain and management in order to obtain an estimate of future wood supply must necessarily involve many highly variable factors. The chief elements concerned, however, can be classified as positive or negative.

The plus side of the picture includes the following considerations:

1.) The direction of the growth trend is up-

wards. Although the rate of growth gain is probably not as rapid as indicated by the figures listed on pages 12 and 13, it is nevertheless considerable.

2.) Replacement of virgin stands, most of which show no net increment, by young second growth will improve the over-all growth rate. As of 1945, about half of the nation's supply of sawtimber was still in virgin stands, largely located in the West, but it is being cut gradually and replaced by second growth.

3.) Construction of additional access roads in National Forests can materially increase their contribution to the total cut. A large volume of federal timber is now being lost because it cannot be reached as the trees mature or die from insect infestations or disease. The 1950 cut of National Forest timber, by some 27,000 private operators who purchase the stumpage from the Government and then harvest it under Forest Service supervision, amounted to  $3\frac{1}{2}$  billion board feet, or about  $6\frac{1}{2}\%$  of the nation's total cut of 52 billion.

The Forest Service estimates that an investment of \$100 million for main log-haul roads would make possible a total harvest, at sustained-yield rate, of about six billion board feet annually. This would be an annual increase of  $2-2\frac{1}{2}$  billion board feet; which, at present prices, would bring into the Treasury more than \$15 million a year, perpetually. Industry believes this estimate to be ultra-conservative. It would also relieve cutting pressure on private timber and thus permit more second growth to reach commercial maturity.

4.) Continuing improvement in fire coverage and performance will further reduce timber losses in this category. Over the period 1945-1949 total expenditures by public agencies and private sources for fire protection and control increased more than 60%. Mounting interest and understanding on the part of the general public gives evidence that this uptrend will continue.

5.) A large-scale program, coordinating all forest interests, is now being organized to deal with the problem of losses to insects and disease. Although the Department of Agriculture has been engaged for some time in developing techniques to suppress and control such depredations, and considerable control work has been done, no big integrated program has been possible to date; due chiefly to a lack of appropriations, or requests therefor, result-



ing from the unspectacular nature of the problem. Combined public and private expenditures, under established programs, for pest control in 1949 totaled only some \$8 million, in contrast to about \$43 million for control of fire. (Forest industry spent additional millions for fire suppression.) We are losing to pests and blight much larger volumes of timber than are being damaged or destroyed by forest fires.

The character of this problem differs basically from that of fire prevention which is amenable in part to educational and legislative measures; over 90% of our forest fires being caused by man. Many forest diseases have to date defied investigation. Some of them are of foreign origin and have made their way into U. S. forests despite strict quarantine and import regulations.

Also, there will continue to exist the possibility of epidemic attacks by hitherto unknown or foreign diseases which might well cause serious regional losses of commercial timber during the period re-



quired for the development of adequate control techniques or for the diseases to play out and the timber affected to be replaced by other species, possibly of less commercial desirability.

Based on the provisions of the Forest Pest Control Act of 1947, however, a coordinated attack is now getting under way, and a wide program of research, detection and control is in the early planning stage. Also, the high degree of initial success attending recent large-scale measures taken jointly in the Pacific Northwest by federal, state and private interests gives promise that losses will diminish as funds become increasingly available. In addition, good silviculture and forest management are among the most effective measures of prevention. Increasing adoption of improved forest practices will therefore also serve to minimize such losses.

6.) A considerable improvement in the management status of privately-owned timberlands has taken place since the Reappraisal was made in 1945. All three classes of holdings — farm, non-farm, and industrial — participated in this advance.

Information received by The American Forestry Association from 25 states reporting on 230 million acres in private ownership, and covering the period 1945-1949 indicates that the private area classed as being "without management" was reduced from 149 million acres to 125. The industrial properties showed by far the greatest progress on an acreage basis; an advance corroborated by the rapid increase of expenditures by industry for both protection and management, over and above that occasioned by the decreased purchasing power of the dollar. These gains evidence a strong trend towards

the growing of tree crops on a continuous basis and also attest to the increasing effectiveness of educational programs aimed at small owners.

7.) Tree-planting activity has shown a recent rapid increase and may be expected to continue accelerating for the next several years. During the War, nursery production and reforestation activity were very sharply curtailed. In 1945, however, there occurred a notable revival of interest. The job of restoring nursery output required about three years. Since 1947, however, a marked gain in area planted has occurred; the 1950 figure being estimated at 500,000 acres. Much of this progress was made possible by the introduction of tree-planting machines. Of the total acreage planted in the period 1945-49, namely 1,144,000, almost 60% was on the small ownerships; the balance being about equally divided between public lands and industrial properties.

Many new nurseries have been established both by the states and private industry. The Clarke-McNary Act has been amended to make non-farm owners eligible to receive public planting aid, and appropriations have been greatly enlarged.

Despite this upsurge of activity, the acreage planted totals to but a very small fraction of the aggregate area of commercial woodlands estimated by the Forest Service in 1945, as being in need of reforestation — namely 60 million acres. Industrial sources, however, question the accuracy of this estimate, believing that much of the above area will never justify the expense of rehabilitation; and also point out that natural reseeding has already caused a sharp reduction of the balance.

Although the effects of recent tree planting will not begin to show up as usable timber volume for some 15 to 20 years, large-scale planting by lumber and pulp companies gives assurance that major units of our forest industry are adopting a permanent policy of growing timber. The encouraging aspect is the upward trend in the urge to plant, on the part of all classes of private owners, and its potential if accompanied by increased educational and technical aid.

8. The present trend toward more and better-coordinated research holds promise of continuing advances in the technology of wood utilization. This will tend to stretch the effective supply of timber.

Operating to offset the favorable factors outlined above are the following considerations on the negative side:

1.) According to Forest Service estimates of 1945, approximately one half of the commercial forest area in operation was managed under cutting practices that either left the land with a limited means of natural reproduction, often causing deterioration of species with consequent reduction in both quality and quantity of growth, or that destroyed both the timber values and the means of regeneration. Most of this malpractice occurs on the medium and small holdings. Unless legislative curbs and more education are put into effect at once, considerable destruction and deterioration of growing stock will continue. To redress the resulting damage to the nation's growing stock of timber will require a considerable period of time.

2.) Current high prices for stumpage tend to cause some owners of small and medium forest properties to clear-cut for immediate cash profits.



3.) Population growth will probably exert a mounting pressure on our wood resources, despite the possibility of a renewed decline in per capita consumption.

4.) Rapid expansion in the chemical use of wood, as cellulose, for the manufacture of an increasing variety of products may heighten the demand for timber.

5.) In many forest centers of the West, post-war increase in the number of small, inefficient mills has outstripped the potential gain in forest growth achieved through planting of non-stocked lands. In these localities both mill capacity and drain exceed the reproductive power of forest soils. Also, former cutting without provision for reproduction has caused a gap in the sequence of age classes of available private timber. Many owner-operators are faced with the alternative of a reduced old growth cut or of prematurely harvesting their young second growth and then shutting down entirely a few years hence.

The larger units of forest industry are aware that in order to build up the growing stock of young timber on cut-over lands it is imperative that a reduction in the total sawmill capacity of such regions be carried out to the point where it does not exceed the growth of tributary timber. Fortunately, much of the virgin timber in public ownership has not as yet been heavily cut. Much of it will be needed to sustain the forest industry until private young-growth reaches merchantable age. This will require more access roads.

Although more favorable taxation and low-interest credit would assist owners to carry growing timber, some segments of the industry believe that the most effective remedy would be cooperative, sustained-yield management. This implies: 1.) operating agreements between public agencies and private owners; 2.) the integrated operation of various private holdings now under separate individual managements; and 3.) the formation of processing and marketing cooperatives for small owners.

The patchwork pattern of ownership, prevalent throughout most forest areas, constitutes a major obstacle to the adoption of sustained-yield management. Means must be found to consolidate scattered holdings into a greatly reduced number of cooperatively administered units.

Until this problem has been solved, it would seem necessary to reckon with the possibility that the output of forest products may suffer a considerable, though temporary, decline over the period between the practical exhaustion of the privately-held virgin timber and its eventual replacement by commercially mature second growth.

6.) At the existing average level of management, nation-wide, clear-cutting tends to cause a reduction in the total productive area of our forests. In the Douglasfir subregion of the Pacific Northwest, under the system of area selection whereby the timber is cut in blocks or "staggered settings," some 10% of the cut-over land does not reseed naturally, but is replanted by artificial means. Elsewhere, however, clear-cutting often lacks careful provision for reproduction and the area loss can be considerable. Constant improvement in fire protection is diminishing the loss of productive area caused by "reburns" following in the wake of destructive cutting. Nevertheless, clear-cutting will continue to

reduce our effective forest area until such time as "good or better" management obtains on a very large proportion of privately-held timberlands in all classes of ownership.

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Through large-scale use of substitutes our economy could conceivably subsist on a moderate supply of high-priced forest products. Since we have ample forest soil and enough know-how, if applied, to grow all the wood we shall need in the foreseeable future, wider application of knowledge is clearly indicated. As the influence of virgin timber wanes and is replaced by that of planned regeneration, it is probable that the availability of finished forest products will increasingly reflect the cost of growing trees as a crop.

With respect to possible emergency needs, World War II proved that wood was a basic essential to the military effort. Huge quantities were required for construction, crating, etc. Shortages of certain species became acute, due in part to lack of woods, labor and equipment. Although there has occurred a striking advance in the technology of wood use and a considerable improvement in forest management, nevertheless the over-all timber situation has certainly not altered sufficiently to preclude the recurrence of some shortages in the event of full-scale war. We are still a long way from a level of timber volume that would eliminate the need for heavily depleting our supply in the event of a renewed emergency.

It is not within the province of this report to attempt exact prediction of the future levels of timber supply in relation to the probable demand for forest products. However, the factor of time is vital with respect to the preservation of our growing stock. A rapid intensification of present programs is needed to reduce the destruction of that stock and to accelerate the practice of growing tree crops. In addition, the enactment of effective basic legislation by the individual states will go far towards attainment of a volume of wood production commensurate with our expanding economy and the requirements of defense.

### Foreign Trade Position

International trade in lumber has never been of sufficient magnitude materially to affect our total supply. The volume of both our imports and exports has been very small in relation to domestic production; usually less than 5%.

Traditionally, the U. S. has been a net exporter of lumber. Since 1941, however, this position has been reversed. The estimated 1950 excess of imports was more than 2½ billion board feet. Nevertheless, even this volume was only some 7% of the combined total of estimated domestic production plus net imports. Roughly 90% of the lumber imported was in the form of softwoods from Canada.

Our foreign trade in forest products other than lumber is also small in comparison with domestic output. In 1950, approximately 9% of the pulpwood and 14% of the wood pulp used in the United States was imported. As to paper and paper board, some 16% of our consumption was imported; including, however, about 84% of our newsprint needs. In the case of each of these products, a very high percentage was derived from Canadian forests.

Authorities disagree as to the long-term avail-

ability of these Canadian imports; largely due to inadequate statistics. Public agencies believe that the drain on Canada's timberlands now under operation exceeds the current rate of growth. Industrial sources take issue with this view and also point out that only a small part of the Dominion's potential forest resource is currently being operated and that the differential in freight rates will continue to work to U. S. advantage in relation to other foreign sources of demand. In view of the solidarity of U. S.-Canadian relations, there can be no doubt that this source of wood supply is favorably located from a logistic point of view.

In addition, it has been estimated that Alaskan forests, only just beginning to be tapped, are capable of supplying annually more than 150 million cubic feet of pulpwood, an amount sufficient to produce about one quarter of our newsprint needs.

In the light, however, of a growing world-shortage of timber, particularly in high-grade softwoods, and of the increasing obligations of U. S. economic aid abroad, it would seem that our security requires that we achieve a level of timber growth that will permit an exportable surplus of forest products to meet the needs of our allies.

### Quality

Implicit in the consideration of supply is the question of the quality of the wood grown by our forests. This can be evaluated only with reference to current manufacturing techniques and to the quality of finished forest products. Since the quality of wood is in part a function of the age of the tree, when mature forests are liquidated and replaced by second growth of the same species there occurs an automatic drop in quality that could be redressed if the new stands were permitted to mature — a cycle of such length as to preclude most commercial operation. This factor is inevitable and will continue until all virgin stands have been replaced by young, growing forests.

If the volunteer regeneration occurs in the form of species of lower commercial desirability or of no present value, the factor of degrading quality is multiplied. This has obtained in the past over large areas due to the former migratory character of our lumber industry, constantly moving into new regions of unexploited virgin timber. Today, the incidence of this factor is decelerating, due to improved reproduction on large holdings and increasing awareness by small owners of the profit in good forest practice.

A third element is the quality-drop that continues to take place as a result of inadequate forest-management practices, principally on the small holdings.

Tending to counter the above factors is the rapid technological advance that has recently occurred in the conversion and utilization of wood. From smaller trees and formerly "inferior" woods, the large units of our forest industry today are turning out products that previously required lumber of traditional sizes and shapes.

New bonding and gluing techniques permit the fabricating of wooden structures stronger than those cut from solid timbers, and chemical research has made possible the conversion of wood into increasing volumes of cellophane, rayon, alcohol, protein yeasts and a great variety of plastics. Also, new chemical processes are providing commercial uses

for species of trees formerly considered to be valueless.

In general, however, there has occurred an appreciable though partly unavoidable decline in the availability of many types of high-grade finished forest products. Consequently the demand for premium products manufactured out of old growth timber has continued at a high level and will probably remain so until our virgin stands have been entirely replaced by second growth. Already there is evident a trend towards stretching the remaining supply in old growth stands. When it finally plays out, we shall simply have to get along without it.

### Technological Advance and Utilization

New technical processes are making it possible to derive more different products from the same tree and to process a much wider variety of products under the same management. This advance is based on constantly increasing expenditures for research, both public and private. A trend towards integrated manufacture is appearing in our forest industry — plants in which the by-product of one process becomes the raw material for the next are simultaneously producing lumber, pulp, plywood, insulation, etc. This spells greatly increased utilization and a marked reduction in waste. In a few of these plants, virtually all the wood brought in from the forest is converted into commodities, including the bark.

To date, however, this trend has involved mostly the large units of our forest industry. The great majority of wood-processing plants still continues to produce specialized products and to burn as fuel or discard the resultant wood-waste. As of 1944, the Forest Service estimated that only 43% by weight of the wood we cut, destroyed in logging, or imported actually appeared in products other than fuel.

About one third was not used at all, and the remaining one fifth was burned as fuel. Logging accounted for 45% of the total waste and manufacture 55%. Three fourths of the waste volume occurred in the production of lumber and 51½% in the making of pulp and paper. The progress that has occurred in utilization since 1944, however, has certainly improved the situation somewhat.

In determining the above ratios, "waste" was considered in its intrinsic sense; wood not used was classed as waste whether or not its utilization was economically feasible. Actually much of this so-called "waste" consists of material that cannot pay its way out of the woods at the current levels of technology and demand. Preventable waste is there-



fore very much less than the indicated total. A further consideration is that the large volume of wood that matures and then decays unharvested for lack of access roads and other causes is also a part of the total picture.

In addition, technological developments are having a direct effect on forest practice with respect to the growing and harvesting of increased volumes of wood per forest acre. Industrial foresters today are increasingly concerned with growth rates and with the fertility of forest soils; their loggers now bring in one quarter of the wood that formerly was left as slash. Pre-logging is on the increase—the removal of poles and pulpwood prior to the major logging operation, with a consequent reduction in breakage as the large trees are felled.

Increased investment in fixed plant, per unit of raw material, has stepped up the need for good forestry. Adequate and permanent supplies of local wood will become increasingly essential. The stake in wood manufacturing and processing plants has grown twelvefold since 1900 and now exceeds \$7 billion; a fact that is exerting a very considerable influence towards the continuous growing of tree crops.

In this regard, there appears to be next to no present danger of monopolies arising in our forest products industry. The multiplicity of producing units plus their traditional character of individualism continues to cause intense competition and eliminates the probability of combinations in restraint of trade. Today, no single manufacturer or wholesaler markets more than 5% of the total lumber or plywood currently produced.

Intensive forest management only became possible on a large scale with the advent and expansion of the pulp mills. Prior to such time there had been virtually no market either for small trees removed in thinning operations, or for culls or tops that had been left behind in logging. The ability of pulp mills to make use of such material has greatly altered the situation on areas located within their radius of purchase and is having a mounting effect on the reduction of waste and on the application of forestry.

Due to the expanding requirements of this industry, forest owners are becoming increasingly aware of profit possibilities in the sale of improvement cuttings to the pulp mills. The ready market for such material is beginning to have a measurable effect in the reduction of clear-cutting without provision for restocking. Also, the resulting increase of interest in timber-growing, evidenced by the surge in demand for nursery stock, has caused a big improvement in the public attitude towards fire protection, especially in the South.

During the 1940's the expansion of the pulp and paper industry was remarkably rapid. Net worth more than doubled. Domestic production of wood pulp rose from 7 million tons to a level of 15, and that of paper products from 14½ to 24. More than 50 new mills have been constructed since 1944, each costing many millions of dollars and hence predicated on the assurance of a continuous supply of raw material.

Today, in many localities, pulp mills compete with lumber manufacturers for wood. The importance of this factor, however, is being qualified by a growing practice of log-trading, whereby pulp

concerns route their large logs to local lumber mills in exchange for logs of too small a diameter to be converted economically into lumber.

### The Problem of Small Holdings

Our woodlots hold the key to the solution of the forest problem. Both public and private agencies agree solidly on this point. These small ownerships, totalling over 4 million separate holdings, comprise 56% of the total area of our commercial forests and probably contribute between 40% and 50% of the present timber cut for commodity use. They are the most accessible and potentially the most productive forest lands in the country. Today they are generally in the poorest condition. As of 1945, the Forest Service rated the cutting practice on these woodlots at 70% "poor" or worse. Damage of growing stock is obviously involved, and this adversely affects our future timber supply.

Forestry is greatly facilitated when two basic factors are combined: 1.) unified or single management of an area large enough to provide integrated conversion plants with a steady permanent flow of raw material; 2.) continuity of management and operation. It is for this reason that the most intensive management methods currently employed are to be found on some big industrial properties of long standing. The fact that three-fourths of the private commercial forest is split into more than 4 million small holdings, on many of which there is a rapid turnover of ownership, therefore constitutes a major obstacle.

The origins of this problem include the effects of early land laws, the ready availability of cheap virgin timber and the fact that forestry did not become an integral part of our system of agricultural extension until the 1920s. Designed to promote agricultural settlement and build a nation of small home-owners, our policy of land distribution restricted to 160 acres the amount of land that individual settlers might acquire. In addition, scattered sections were granted to schools and alternate sections to railroads as the economy developed westward. The result is a highly complex pattern of mixed private and public forest ownership.

Until recently no small owner could expect to be reimbursed for his effort or expense in maintaining his woodlands through proper cutting methods, because buyers could easily obtain timber elsewhere at a lower price. Also, the economic status of the average woodlot owner has not enabled him to heed appeals to his sense of responsibility for future generations. An additional factor is that only an insignificant number of such owners consider forest products as their major source of livelihood. Most of them are either farmers or engaged in absentee pursuits. Several hundred thousand of the small properties are not being operated at all.

Essentially, the job of improving the management of these small tracts consists of the necessity to awaken owners to the profit possibilities of good forest practice, to instruct them, and, to remove or lessen the obstacles to their success. Active cooperation between federal, state and private interests will be essential. Many factors are involved.

There is need for greatly expanded programs of educational aid in growing, harvesting and marketing for stepped-up production and distribution of seedlings and for public and private provision of cheap forest credit and insurance. One of the most





serious economic blocks appears to be the absence of markets available to small owners located in areas beyond the present purchase-radius of permanent forest industries. The provision of processing co-operatives in such areas, whether initiated by public or private funds, might well prove to be part of the answer to this question.

Such organizations should be instrumental in supplying steady outlets and assisting in the profitable liquidation of low-grade second growth that now claims much of the growing power of our forest soils, particularly in the Northeast. They should also operate to free the woodlots from dependence on itinerant sawmills. Seeking a quick dollar in times of rising prices and having no concern for future productivity the operators of these 40 to 50 thousand small mills often induce owners to sell their stumpage on a clear-cut basis. In most cases the owners, being unaware of the value of their timber, receive but a small fraction of its actual worth and also permit the destruction of their growing stock. It may prove necessary, therefore, to control and assist the operations of these mills.

To date, cooperatives have not played a large part in U. S. forest activities. A few have become well-established concerns. Many, however, have failed; despite the provision of considerable public aid. Most of them have experienced difficulty in maintaining sufficient working capital to attract the services of highly-qualified management. Also, they have not had recourse to a dependable source of credit. Loan facilities established for agricultural cooperatives are restricted to associations that do most of their business with farmers, whereas much of our woodlot area is held by non-farm owners. In addition, collateral requirements are inapplicable.

Given adequate initial assistance and improved credit provisions, cooperatives could now take advantage of increasingly favorable economic trends to become self-supporting. Despite a financial record that is far from impressive, they have already met with sufficient success in obtaining better markets and in effecting improved forest practices to warrant inclusion in any comprehensive program for the development of the nation's forests.

Many state systems of forest taxation urgently require revision, such that the tax load will be removed from growing timber and be imposed in the form of a yield tax at the time the timber is cut. This eliminates the tax pressure on small owners to clear-cut their stands and also times the levy to coincide with the availability of cash. Today, only 14 states have some form of yield tax. Another 11, however, provide for the tax exemption of certain qualified forest lands. Elsewhere, there exists very considerable inequity in the assessment of general property taxes.

The current high level of stumpage prices is inducing some owners to clear-cut their timber now,

rather than to engage in long-term forest management. The occurrence of this liquidation to date has had little material effect on available supplies of wood, but may possibly become a considerable factor in the near future. Such clear-cutting may be reduced by the rapid net shrinkage that has occurred in the total of farm mortgages outstanding. Agricultural properties, about half of which include timberlands, are coming into progressively stronger hands; a trend which should tend to alleviate the financial pressure toward clear-cutting for immediate cash returns.

As to the educational approach, an encouraging start has already been made. Under the cooperative program of joint federal-state projects, more than 200 "farm foresters" are currently giving on-the-ground assistance to the nation's woodlot owners. Approximately 300 state foresters and 65 extension foresters are now engaged in similar activity.

In addition, the concern of wood-processing industries in an assured and continuing supply of raw material is having an increasingly important impact on the woodlot picture; — hundreds of industrial foresters are giving small owners free advice, help and planting stock.

A staff of 50 Soil Conservation Service foresters has had great influence in awakening farmers to the advantages of woodland management. As a result of "farm plans" in the Districts, some 300,000 acres have been planted, 5 million improved and 50,000 acres of windbreaks set out. But for the shortage in nursery stock, these figures would have doubled.

The efforts of public agencies and forest industry to provide small owners with on-the-ground assistance are meeting with accelerating success. There can be no doubt of their efficacy and acceptability; the demand for help greatly exceeds the scope of present programs. To date, however, only a small fraction of the total of such owners has been reached.

In the light of the aggregate value of the timber now standing on these small properties and of their production potential, the amount of funds currently devoted to the job of owner-education is trifling. The initial step towards the further solution of the problem would appear to be via a rapid, large-scale expansion of both public and private education programs, backed by greatly increased efforts on the part of all forest interests to effect the adoption of basic minimum cutting-practice legislation by the individual states.

There still appears to be a considerable lack of information on the basic factors underlying the ownership of small forest properties; stability of tenure, reasons for purchase, occupational status of owners, proximity of nonresident holders. Such factors vary widely between forest regions, yet there is ground for the opinion that current national programs of aid for the small owner are based on insufficient data and may well require reorientation. The great issue is whether we shall be successful in educating and inducing those owners who hold the 60% to 70% of small ownerships on which the cutting is still poor or destructive to adopt good forest practices within a safe period of time.

Today, more than ever before, the task is favored by economic realities; in many forest regions woodlot owners can now grow crops of trees for profit. A major factor in this change has been the great



expansion of the pulp industry which has brought about a developing market for raw material unfit to be converted into lumber.

Further improvement in the management status of small holdings can be induced by the provision of long-term, low-interest credit facilities backed by forest insurance; both initially supplied by existing agencies until such time as the steadily diminishing risks involved have been demonstrated to be within the limits that will attract private capital on a large scale.

The availability and gradual adoption of such aids should reduce the amount of clear-cutting that often precedes a change of ownership in small holdings, because the timber values currently involved are not substantially reflected in the selling price obtainable. These facilities should also tend to effect a change in rural land-use habits.

Some of the Federal Land Banks are making a small but increasing volume of loans secured in part by standing timber. The Farmer's Home Administration also makes credit available for the improvement of farm woodlands. The over-all situation, however, is such that forest owners cannot borrow from commercial banks on the sole security of their timber or woodlands, on terms calculated to foster deferred harvesting and the development of growing stock. Despite the notable advances in both management and protection, National Banks are still prohibited from making such loans, on the basis that forest holdings do not constitute "improved" property.

Once it becomes common banking practice for standing timber to be accepted as collateral, the improvement in the management status of the woodlots should receive a very considerable impetus.

### Regulation of Private Forest Practices

There is widespread and increasing recognition that the privileges of private ownership do not imply the right to disregard the public interest. Today, many owners of large and medium timber holdings accept this principle. Management practices on many such holdings are today in excess of the requirements of any public regulations so far in force. The majority of small owners, however, are still unaware of the significance and contribution of their holdings to the nation's forest picture, and, many are disinclined to surrender any part of their individual freedom of action.

Despite growing public understanding, some owners, both large and small, continue to cash in on quick profits by liquidating their growing stock and imposing on their forest soils a long period of idleness, in disregard of the interests of their neighbors and of the community at large. For this reason there is need for public regulation to prevent such action. Although some segments of the industry believe that industrial self-regulation will prove adequate, the issue today seems to be whether cutting-practice standards should be established by the Federal Government with opportunity for state cooperation and enforcement, or whether the states will act effectively alone.

Federal regulation of private forest practices has been a national issue since 1920. A series of bills has been introduced in Congress seeking to effect such regulation. So far defeated, they have served

a useful purpose. The fear of federal control has undoubtedly speeded some state legislation and exerted an influence towards adoption of better forest management on larger holdings.

The Anderson Bill (S.1820), introduced in 1949, is the latest embodiment of the Forest Service's contention that basic minimum cutting standards should be applied nationally to private forest operations. This proposed legislation provides for enforcement by the states acting for the Department of Agriculture; with an overriding provision for direct federal enforcement in the case of those states that fail to comply or that request such intervention. In either event, this would involve the presence on the forest owner's property of officers representing federal as well as state authority and seeking to limit the manner in which the owner grows and harvests the products of his soil.

Many people believe that holders of small forest properties would refuse to cooperate; that an attempt to apply such a system to several million landowners, in most of whom the American tradition of individualism and self-reliance is still strong, might well produce resentment on a very large scale; and that the degree of such resentment would seriously impair the essential cooperation that is being built up between public forest agencies and private owners. Some think it might defer the development of local opinion favorable to state standards. Others believe that these fears are unfounded and that federal standards would be accepted, once the need for them were understood.

The fact that over the years federal farm legislation has been largely confined to enabling and permissive measures suggests recognition of the difficulty of trying to coerce American landowners into adopting practices directly concerned with methods of land operation.

The current trend toward interstate compacts for fire control and even for interstate resource development, if fully implemented, would offset the argument that fire is no respecter of state lines.

Short of full-scale war, we see no immediate crisis in our timber supply sufficient to require now the experiment of federal regulation.

The current status of professional opinion on this issue has been clarified by a referendum held in May, 1950, by the Society of American Foresters. The question posed was as follows: "Shall the Society of American Foresters through its Council favor or oppose the principle of federal regulation of private forests, and federal legislation looking to the establishment of this principle?" Out of a total of over 6100 members eligible to vote, some 3600 ballots were cast; in the ratio of 7 opposed to 3 in favor.

As to state legislation, the desirability of establishing basic standards of forest practice in all forest states is clearly evident. Enforcement of such standards presents difficulty. Sanctions have proved effective only as forest owners and the public come to appreciate the need; and that is a matter of education.

In Washington, Oregon and California, there is a heavy concentration of large forest properties bearing high timber values per acre. In this region, which accounted for more than 40% of the nation's 1950 production of lumber, effective state regulations are now in force. They were enacted with the vigorous sponsorship of local forest industry, and

a large degree of compliance has resulted. Thus, when the majority of owners in a given region become aware of the values inherent in good forest management and adopt sound forest practices, they will demand local legislation to force the others into line.

In the East, small properties dominate the pattern of ownership. Although a few of the states concerned have enacted some form of regulation of private forests, coverage and enforcement are both inadequate. The power of an individual state to impose such regulation has already been upheld by the U. S. Supreme Court, but, to date, only 16 states have adopted any form of control, varying in approach from strictly imposed performance bonds to frank inducement through forms of tax alleviation. In four of them virtually no attempt at enforcement is being made. Also, some of the standards are too low to afford adequate protection to the growing stock involved.

The adoption of adequate legislation by the great majority of forest states will require a considerable period of time. Despite the recent over-all increase in state appropriations for forestry, some state agencies are still heavily handicapped for lack of funds. Their appropriations are insignificant in relation to the value of the timber resources involved, and salary levels are in consequence too low to attract and retain qualified talent without undue personal sacrifice.

Also, the basic legislation from which their authority is derived fails to provide for merit selection or administrative continuity. This subjects executive personnel to political pressure and precludes the development of long-range forest programs. In such states, effective enforcement of state regulations governing private forest practices will require the prior elimination of these underlying drawbacks.

In view of the fact, however, that it has but recently become possible for small owners to engage in forestry for profit, it would seem reasonable to expect that further adoption of state regulations will proceed at an accelerated pace. As the movement spreads, standards initially low should gradually be raised. Meanwhile, much destructive cutting will continue; but in diminishing volume as educational program take increasing hold. Even substantial temporary losses may be justified to maintain continuance of the progress in cooperation between public and private interests.

The Foundation favors effective state legislation and state enforcement. We believe in the ability of people at the local level to accomplish what is desirable in the public interest when the need has been made clear to them. The methods by which the desired end is accomplished should be decided and applied locally. That is in the best tradition of our democratic system. It is only when the public interest requires action, and local government is unwilling to act, that federal regulation is justified.

We believe that increasing local understanding of the need for public regulation will result in more effective action by the states and that growing profit opportunities will cause more and more small owners to adopt better practices. We are of the opinion that federal efforts should be concentrated on helping the states to establish reasonable standards. In the event, however, that adoption by the lagging states of cutting controls sufficient to protect the

resource does not take place at a reasonably early date, federal participation will become inevitable.

No system of control can be wholly satisfactory, and the problem of enforcement on several million properties will be complicated. Regulation alone is not the full answer. It is in fact a stop-loss measure. In the meantime, there is immediate need for a greatly expanded educational effort to induce voluntary adoption of practices that will realize the growth potential of our private forest lands.

#### Other Values

Other than in the production of timber for commodity use, our forests play a vital role in the national economy through conserving and stabilizing water resources and in protecting agricultural soils and crops. In addition they provide essential habitat for wildlife and a primary source of recreation.

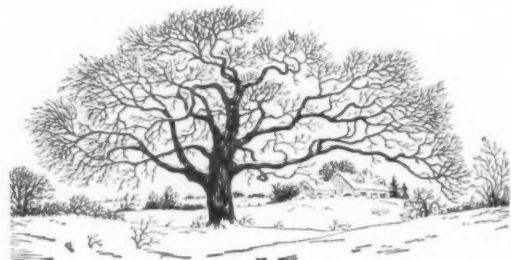
There is a growing recognition of the basic fact that renewable resources are interdependent; that the management of any one of them directly affects the status of the others. As the requirements of our rapidly expanding population and industrial activity strike the resource base with an increasing impact, it is becoming apparent that integrated management of soils, water, forests and wildlife is essential to a full and balanced use of these resources.

Falling ground-water tables, irregularity of stream flow, pollution and erosion, with consequent siltation of reservoirs and navigable rivers are combining to pose serious problems of water supply in many localities. The availability of adequate volumes of water for industry, for irrigation and for domestic use is often closely coupled to the forest practices and agricultural methods prevalent on tributary watershed areas sometimes hundreds of miles upstream.

Good management practices increase the ability of forest lands to conserve and regulate the flow of water through the reduction of surface run-off. On many watersheds that guard municipal and industrial supplies, water is a far more valuable forest product than timber. National Forests contribute much to the nation's water supply since they are located largely in mountain areas that generally receive the greatest amount of precipitation. In many drainage basins, national-forest lands are of critical importance in protecting water resources.

Large dams and other engineering structures are now an established part of flood prevention and control, yet the need for such construction will be reduced as improved practices in the management of our forests, ranges and farmlands takes over at an accelerating pace.

Over very large areas, the stability of agricultural soils is directly dependent on the influence of ad-



jacent forest lands that absorb and retard the runoff, thus also providing a larger and more regular flow of ground water for crop needs. In addition, woodlots and shelterbelts protect a huge aggregate area of agricultural lands from the effects of wind.

Forests constitute a major factor in our recreational activities. In 1950, over 25 million people visited the National Forests for relaxation, sport and stimulus; including some two million hunters and three million fishermen. These areas total to only a small part of the woodlands so used by countless other millions. As the work-week shortens and our population expands, this becomes an increasingly important factor in the maintenance of both the nation's health and its morale.

It is manifestly impossible to place a monetary value on these forest influences. They do not appear on any balance sheet of timber. Their aggregate contribution to the national welfare, however, is enormous.

### The Growth of General Public Interest

Over the last decade there has occurred a marked increase of interest on the part of the general public in the protection and development of our forests and a growing awareness of the role of forest resources in the national economy. This increase has stemmed very largely from the educational efforts of the Forest Service, the states, forest industry and private conservation groups.

The dramatic growth in public support of forestry is evidenced by the increasing number of forest-conservation groups and by the enlarged programs of the older organizations. Also, during 1945-49, state appropriations for forestry increased threefold, and the number of state forestry employees doubled. Over the same period, annual federal outlays rose from a level of \$49 million to a total of \$85 million. Discounted to 1944 terms, this represents an increase of one-third.

The cooperation of business and industry with forest programs is advancing steadily. The U. S. Chamber of Commerce maintains an active conservation department, the American Bankers Association is promoting the interest of state banking groups in forest management; and the Conservation Committee of the National Association of Manufacturers is playing an increasingly important part in forestry activities. The CIO's Committee on Conservation and its International Woodworkers of America are also contributing to public understanding of the forest problem.

The advance in public awareness of forest values has received further impetus from two nation-wide movements launched in 1941 under the sponsorship of forest industry; the "Keep Green" programs and the American Tree Farm System. Both are administered by American Forest Products Industries, Inc. The former has become a useful supplement to the federal-state cooperative programs of fire protection. Directed along educational lines, it is a grass-roots campaign in which the general public takes an active part. Via the press, radio and special publications, the value of forest resources is being brought home to schools, business, labor and civic organizations. This movement, operated on a local basis, has spread to 33 states.

The Tree Farm System is composed of private forest lands dedicated to the continuous growing of trees for commercial purposes. Some 27 million

acres are now involved, in 34 states. Continuing adherence to prescribed standards of management is essential to certification. Although 80% of the acreage concerned is owned by industry, about three-quarters of the system's 4,000 units are held by farmers or other small owners. It is making a significant contribution to the understanding and improvement of our forest situation through the demonstration that trees can be grown as a crop.

### Extension of Public Ownership

On many counts, the National Forests have made a major contribution to the nation's timber situation and will continue to play a crucial role. Over the years, they have served to check excessive exploitation, to stabilize the output of forest products and to exemplify the advantages to be derived from multiple use for water yield, timber production, grazing, wildlife preservation and public recreation.

They contain within their boundaries a very large number of scattered private holdings that total to over 40 million acres. In the interests of operating efficiency, the Forest Service is engaged in acquiring a portion of these properties in exchange for other National Forest lands or stumpage. The aggregate area so acquired over the period 1945-1949 exceeded 1,400,000 acres. There seems no doubt that this practice has served to promote improvements in administration. The full development of our forest resources, on the basis of multiple use, requires more balanced and better coordinated administration by federal, state and private interests.

In 1946, The American Forestry Association recommended a state-by-state study of the desirable balance between federal, state and private ownership, with a view to mutual understanding and agreement among all classes of forest owners as to further acquisitions of forest land by public agencies. Since that date, however, official committees have been established to consider this problem in only four states. There is a clear need for similar action in all forest states.

In the belief that current and prospective demand for forest products will provide adequate incentive for the development of most of our commercial timberland by private enterprise, the Foundation is of the opinion that further acquisition of forest land by public agencies should be restricted at this time to rounding out present public holdings and to those properties that do not have a reasonable prospect of effective management under private ownership. Public acquisition of submarginal and essential watershed lands so located as to constitute basic protection for specific water supplies is urgently required when such lands are suffering from lack of proper management. For the future, acquisition of new properties should not interfere, so far as possible, with the extension of sustained-yield private management.

### Summation

Compared to the conditions that obtained on U. S. forests in 1900, the present management status of our timberlands shows a huge improvement. Also, the recent acceleration in the rate of this advance and the prospect for its continuance give ample ground for very considerable optimism; both are founded on a highly favorable change in the economic conditions underlying the feasibility of growing tree crops on a commercial basis.



In contrast, however, to what it should be and can be, the current picture clearly indicates that we still have a long way to go.

U. S. forestry is only 50 years old. Our first permanent School of Forestry was established at Yale in 1900. Prior to that time, although some 40 million acres of the public domain had been set aside by executive order as national "forest reserve," they were not as yet under active administration. Only nine states were engaged in any form of forest activity and their respective agencies functioned merely as information centers.

Supplied with a superabundance of readily available, cheap virgin timber, next to no consideration had been given by private interests to the long-term management of their forest holdings. In meeting the heavy demands of a fast-expanding economy for construction materials, a purely extractive lumber industry had high-graded the values from north-eastern forests, then razed the Lake States pineries and moved on to exploit the rich old-growth timber of the South. Forest fires raged unchecked, and ownership of standing timber was, in consequence, a high risk that dictated rapid liquidation.

The resulting depletion of the resource was part of the price paid for the extraordinarily rapid development of a nation. Historically, the advent of forest management in most foreign countries has apparently been preceded by depletion of their virgin stands to a point where the growing of tree crops according to plan could compete with such liquidation on a commercial basis. Our own experience, then, has not been exceptional.

Today, professional instruction in forestry is offered by 34 colleges and universities, of which 25 are accredited. The combined enrollment of the latter exceeds four thousand, and degrees conferred annually number about 1,100. Professional training in forestry has become highly diversified and competitive. More than thirteen thousand qualified foresters are now employed throughout the country; including some 5500 by industrial and other private owners, 4700 by the federal agencies and 1200 by the states. The profession enjoys the highest recognition due to rigid standards of competence and ethics maintained by the Society of American Foresters.



A 200-million-acre system of federal forests is under thoroughly competent management. The Forest Service has been developed into a highly decentralized and effective organization that has stimulated, guided and coordinated the progress of every branch of U. S. forestry. Over the years, it has supplied most of the impetus behind the movement and has initiated the greater part of the advances made. Forty-four of the states have established forest agencies, now the administrative core of the cooperative programs.

As to private forest holdings, in 1945 over 60% of the industrial acreage and more than 30% of the farm and miscellaneous holdings in active operation were being managed under cutting practices that provided for the reasonable maintenance of growing stock, and tangible improvement has occurred since that date. All federal timber and 85% of our state and private forest lands are receiving fire protection at a performance level that makes the adoption of forestry a better than reasonable risk.

These facts total to a very considerable achievement.

A great deal more progress must be made, however, before the situation as a whole can be considered even satisfactory. Not until a high proportion of all commercial timber lands are managed under "good or better" cutting practices, and the coverage of improved fire and pest protection is complete, can the management status of our forests be considered as acceptable. This will involve achieving and maintaining better than equal ratios of growth to drain in both sawtimber and "all timber" categories until such time as an adequate reserve of growing stock has been built up. Despite the marked advances made on many fronts, we are still drawing on our forest capital.

As indicated by the Forest Service, the current situation creates a dilemma in which the volume of growing stock must be restored without curtailing the output of forest products demanded by our expanding economy and the defense effort. There is wide professional agreement that the way out is via a broad conservation program that will check the remaining degree of forest destruction, restore idle lands to full production, increase the accessibility and the output of public timber holdings, provide additional protection and effect a higher degree of utilization. This is a large order. It will require time, heavy expenditure of both public and private funds, and stepped-up research activities in silviculture, in the technology of wood-use and in the economics of distribution.

Despite destructive cutting and large-scale clearing of timberlands for agriculture, town sites and transport in the past, there still remains enough forest soil to yield the timber products we shall need. Many people are not aware that half our present supply of sawtimber is in old growth stands. The use of this timber will be vital in meeting wood requirements until adequate volumes of young second growth reach commercial maturity.

Increasing opportunity to make profits through good management will speed progress towards continuous production. This progress will be uneven and spasmodic, but if public and private interests continue to cooperate the nation's forest objectives are attainable.



## APPENDIX

### **The views of the President's Materials Policy Commission on the timber situation, as summarized by the Commission.**

The Nation's position in timber is like that of a man who has long lived in comfort by drawing on his capital and has realized only recently that he must get along on the interest of a much reduced principal. We have cut most of our original timber; not until lately have we given much thought to replacing it.

Scarcity of timber has caused its price to rise in relation to most other materials, some of which have begun to edge lumber out of traditional uses. Yet timber will remain an essential material of industry, chiefly in the form of lumber and woodpulp. Its many other uses may well expand as technologists enlarge their knowledge. For timber, more than for other renewable resources, the problem is not merely to preserve the base of production, but to build it back from a dangerously shrunken state.

Scarcity of saw timber lies at the heart of the timber supply problem. Although *total* forest growth in the United States is nearly equal to the yearly drain upon it, and probably will exceed drain in the future, the annual drain on saw timber—wood suitable for lumber and other products requiring sound logs of considerable size—is about 40 percent higher than the rate of new growth on cut-over land. Unless present trends are modified the gap will be even wider 25 years from now—and by the time most of the remaining virgin timber that now cushions the pressure on supply will have been cut. In 1975, without changes in the rate of improvement in forestry annual growth of saw timber may be between 40 and 42 billion board feet, against a projected total drain of more than 66 billion board feet a year.

Imports will not ease the situation materially; in 1950 they represented only about 11 percent of United States consumption. In many parts of the free world, prospects of timber production are less favorable than in this country. In 1975, the bulk of the supply burden will still fall on domestic forests, probably even more heavily than at present.

Eventually—but far beyond 1975—the United States might be capable of some net exports of timber. In terms of forest policy, 1975 is a way station. We must keep on cutting timber and at the same time build up to a much larger annual production.

There is plenty of land for timber; about 460 million acres are now in commercial forest. About one-fourth of the Nation's commercial forest land is publicly owned, mostly by the Federal Government. Government can afford to think in long terms, and on the whole, publicly owned forests are well managed. But there is room for more *active* management, in order to reduce losses from fires, disease epidemics, and pests, and otherwise to increase timber growth.

Nearly one-tenth of all commercial forest land is held in large tracts by private owners, mostly lum-

ber and pulp-and-paper companies, who look to their woodland for raw materials in the years ahead; in recent years they have managed their forests well without special encouragement.

The rest of the commercial forest land—about two-thirds of the total area—is privately held in smaller tracts; there are more than 4 million separate owners, most of them farmers. With some exceptions, there is room for enormous improvement in the management of these small tracts. Several obstacles stand in the way, chief among them the time element. Trees are a long time growing; they take 50 to 80 years to reach sizes suitable for lumber and about 15 to 40 years even for pulpwood. Few individuals plan over such long periods, and the idea of raising timber as a continuing crop has spread only slowly.

State and local governments and private owners can do most to raise the level of saw timber production, but national action, often in cooperation with States, can help.

There is need for strengthening the broad Federal programs that apply to all commercial forest land. Adequate protection against fire and forest insects and diseases cannot be achieved by separate efforts that stop at owners' lines or State borders. Further research is needed in tree breeding, forestry practices, and wood utilization; much of this research is best performed by the Federal Government.

**The Commission recommends that Federal contribution to the Federal-State program of fire protection be increased up to the authorized level of 20 million dollars annually on a matching basis with States; that a comprehensive nationwide program of forest pest control be developed by the Bureau of Entomology and Plant Quarantine for action by Congress; that forest research by all agencies, Federal, State and private, be intensified and that Federal research expenditures be doubled. (See P. M. P. C., vol. I, p. 41.)**

Federal programs that help private holders manage their woodland better need to be expanded and improved. The education and demonstration work of the Federal-State forestry extension program has had good results, but is still conceived on too small a scale. The Federal-State program of technical assistance to owners of small forest holdings and to small timber-processing concerns has great possibilities, but now employs only about 230 foresters; this number should be compared to a force of 2,000 which would be required to get around once every 10 years to each owner, assuming that only half the total number of small holders asked for help. A considerable planting program on private land is under way; the rate should be stepped up. Most of the planting stock comes from State-owned nurseries, to whose programs the Federal Government contributes.

The present credit system puts pressure on small

forest holders to cut their timber all at once, often wastefully. The owner who wants to build up his timber stands for eventual harvest on a sustained-yield basis has need for loans and insurance from either public or private sources. The ad valorem tax policy of most States also drives owners into premature cutting because the taxable base increases as the timber crop matures.

The Commission believes that the great majority of forest owners will adopt good timber management practices voluntarily. But a minority probably will not respond to persuasion. A few States have enacted laws against extreme forms of destructive cutting. This is a field in which State action is best, but if it proves insufficient, the Federal Government should take necessary steps. In connection with the foregoing:

**The Commission recommends that the Federal-State program of technical assistance to small-scale woodland owners and timber processors be greatly expanded by increasing the number of foresters to 2,000; that Federal financial aid to States in encouraging plantings on private lands be increased; that a national system of forest credit and forest insurance be set up; that whenever practicable States substitute yield taxes for ad valorem taxes on timber; and that for the next 5 years the Federal Government assist the States in establishing systems of compulsory regulation of destructive timber cutting on private land. If at the end of 5 years serious gaps remain in the State system of compulsory regulation, the Federal Government should establish minimum-cutting regulation. (See P. M. P. C., vol. I, pp. 42-44.)**

There is need for more intensive management of federally owned forests. On the National Forests alone, comprising about four-fifths of all federally owned commercial forests, the sustained-yield cut of saw timber eventually could be nearly tripled.

One impediment to an immediate increase in the annual cut is lack of access roads in many areas of the West.

**The Commission recommends that 6,000 miles of access roads be built within the next five years at a cost of 30 million dollars a year to open up the federally owned commercial timber lands in the West; that programs of planting Federal forests be intensified and broadened; and that the level of silvicultural work be raised. (See P. M. P. C., vol. I, p. 44.)**

If all the Commission's proposals for timber were carried out fully and immediately, recurring Federal and State expenditures would rise about 77 million dollars a year above their current level of about 100 million dollars. Sixty-six million of the proposed annual increase would be shared equally by the Federal Government and the States—20 million for fire protection, 20 million for insect and disease control, 15 million for technical assistance, 5 million for tree planting, and 6 million for administering State cutting regulations. The other 11 million dollar annual increase would be borne entirely by the Federal Government—6 million for fire protection on Federal land and 5 million for research.

In addition, the recommendations call for a maximum capital investment of 360 million dollars on federally owned timber lands—150 million for building access roads, 150 million for planting, and 60 million for improving timber stands.

Aside from 25 to 30 million dollar annual receipts from sales of timber made accessible by the new roads, returns cannot be estimated separately for the other proposals, whose effects would be cumulative, with much interaction. Taken together, they should within the next 25 to 50 years add 10 to 15 billion board feet a year to the harvestable supply of saw timber. At 1950 prices this would increase stumpage values 120 to 170 million dollars a year and at the same time assure continuing supplies of an indispensable industrial product.



